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ABSTRACT

This study examined the effects of teaching student teachers specific verbal skills through "explaining," a procedure involving more than lecturing. Another group had explaining as well as peer teaching. A control group had neither. Fifteen-minute tapes were made of the teachers leading a small group discussion which explored a concept, both before and after the course. These tapes were analyzed for percentage of student and teacher talk time, indirect to direct ratio of teacher talk, percentage of accepting verbal behavior of students, percentage of questioning verbal behavior of student teachers, percentage of factual questions asked by student teachers, and percent of pupil questions. Student teachers who had had peer teaching as well as explaining improved in accepting verbal behavior and in questioning verbal behavior. While these teachers asked fewer questions, the quality of the questions improved. Students with only the explaining lessons had also improved by the second tape. They asked more and better questions, and demonstrated more accepting responses than the control group. The results are interpreted to support competency based teacher education programs which set out to teach preservice teachers specific skills. (CD)

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This is a report written separate from the dissertation. I've included it because it does have value to the study.

REPORT FOR THE RESEARCH COMMITTEE AND ELEMENTARY EDUCATION DEPARTMENT AT THE STATE UNIVERSITY OF NEW YORK AT OSWEGO

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U.S. DEPARTMENT OF HEALTH,
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During the course of the research at Oswego, the researcher agreed to write a report relating the results of the study to some short range objective that the researcher submitted to the research committee at Oswego. The researcher also agreed to do a cost analysis of the research. For this agreement, the State University of New York at Oswego provided the researcher with a $500.00 research grant.

Since the results of the research are elaborately discussed in Chapter 5 of this dissertation, it is recommended here that the reader refer to that chapter for the main thrust of the study.

This report is merely an extension of the summary of Chapter 5. The recommendations in Chapter 5 have definite utility for Oswego and should be strongly considered.

The short range objectives that the researcher submitted in December, 1974 to the Research Committee at the State University of New York at Oswego are as follows:

Significance of Study for Funding Purposes (December, 1974)

The proposed research study, "A Study of the Relative Effects of Two Methods for Developing Student Teacher's Skills in Teaching Pupils Using the First Strategy of the Taba Model," is a pilot study to be conducted at Oswego for the following specific purposes:

Short-range Objectives

1. Analyze teaching methodology in teaching student teacher's teaching skills
2. Develop a mini course in the First Strategy of the Taba Model
3. Verify a research instrument
4. Teach toward some specific competencies

1.2.2) 1.2.5)	Conducting and Implementing Instructions
1.3.1) 1.3.2) 1.3.3) 1.3.4) 1.3.5)	Developing Professional Self
1.4.2) 1.4.3)	Developing Pupil Self-Image
1.6.1	Planning
3.2.2	Oral Expression

The competencies are from the Competency Based Teacher Education Program at SUNY at Oswego. They will be explained in detail on the next page.

The study will relate to the specific competencies in the following areas:

1.2 - In the Area of Conducting and Implementing Instruction

1.2.2 Competency: A provisionally certified person will be able to accept pupils' ideas and redirect those ideas without unnecessarily influencing the discussion.

Cognitive: Know the life style of the chilren they're working with. Also, have a knowledge of the growth patterns and the learning styles of children. Know how to be nondirective with people, or have an awareness of nondirectiveness.

Translation: Interacting in a nondirecting manner.

Product: Analysis of results.

(The students will be taught an observation instrument to analyze verbal behavior and will learn specific questioning skills to attain some of the goals in this competency)

1.2.5 Competency: A provisionally certified person will be able to work effectively with groups of different sizes and with multiple groups of people.

Cognitive: Have a knowledge of grouping techniques.

Translation: Grouping and lessons planned for each group.

(Part of the experience the students will have in this study will be with a small group of children)

1.3 - In the Area of Developing Professional Self

1.3.1 Competency: A provisionally certified person will be able to collect data on his/her own teaching behavior.

Cognitive: Knowledge of various ways of collecting data for improvement.

Translation: Prepare list of means applicable.

Product: Collection of data.

(The mini course in this study teaches teacher-pupil observational skills to the student teacher in analyzing verbal behavior and cognitive functioning of the pupils)

1.3.2 Competency: A provisionally certified person will be able to analyze data and identify some patterns of his/her teaching behavior that needs improvement.

Cognitive: Knowledge of data and its implications.

Translation: Analyze data and identify some patterns of his/her teaching behavior that needs improvement.

Product: Personal analysis of strengths and weaknesses.

(In this study, student listens to his pre-tape and analyzes his own behavior according to instructions from mini course)

1.3.3 Competency: (Partially taught in study) A provisionally certified person will be able to, on the basis of analyzed patters, prescribe and implement plans for improvement of his/her own effectiveness.

Cognitive: Knowledge of how to prescribe and implement plans for self-improvement.

Translation: Student will submit prescription, either orally or in writing.

Product: Change in behavior.

(Based on mini course content, student will be requested to write some prescriptions and plans for self-improvement in this study)

1.3.4 Competency: A provisionally certified person will be able to be receptive to feedback from students, fellow faculty, administrators and parents concerning teaching behavior.

Cognitive: Knowledge of possible sources of feedback from students, fellow faculty, administrators, and parents concerning teaching behavior.

Translation: Collection of information.

Product: Analysis of information.

(In part of the study the students receive feedback from their peers and supervisor)

1.3.5 Competency: (Partially taught in study) A provisionally certified person will be able to examine his/her own classroom practices to see if they reflect his/her beliefs, concerns, concept of the teacher's role (philosophy).

Cognitive: Know one's own philosophy and statement of his own beliefs and concerns.

Translation: Collection of information.

Product: Compare data and outcome.

(Student teacher will have to analyze his own teaching behavior in this study)

1.4 - In the Area of Developing Pupil Self-Image

1.4.2 Competency: (Partially taught in study) A provisionally certified person will be able to provide an atmosphere that will help the children perceive and deal with each other as human beings of intrinsic worth.

Cognitive: Know that each individual has intrinsic worth and that it is necessary to know the characteristics of each pupil in the class.

Translation: Develop verbal and non-verbal methods of indicating concern for pupils. Use these methods to indicate concern for the pupils and help the pupils perceive each other as human beings of intrinsic worth.

Product: The environment helps the children perceive and deal with each other as human beings of intrinsic worth.

(Students will be taught accepting verbal behavior, restricting or redirecting questioning skills in this study)

1.4.3 Competency: A provisionally certified person will be able to exhibit behavior in the classroom which is positively reinforcing and acceptant as well as learner supportive.

Cognitive: Knowledge of positive indicators of supportive behavior.

Translation: Develop methods to use these indicators in the classroom.

Product: Demonstration of supportive behavior by words, voice, facial expression, movement.

1.4.3 (continued)

(This requirement will be partially taught in the study, dealing with the verbal behavior)

1.6 - In the Area of Planning

1.6.1 Competency: (Partially taught in study) A provisionally certified person will be able to specify instructional goals and related objectives, emphasizing an interdisciplinary approach when possible.

Cognitive: Identification of objective; identification of areas of potential relationship; concept of interdisciplinary.

Translation: The student will develop and submit lesson plans which give evidence of long-range planning, relating goals, objectives, interdisciplinary aspects within the single plan.

Product: The plan.

Evaluation: The plan will be examined by at least two professionals to be assured that the criteria are met.

(In this study, student learns how to state some behavioral objectives and how to write out his/her plans for the lesson)

3.2 - In the Area of Competencies for Oral Expression

3.2.2 Competency: A provisionally certified person will demonstrate the techniques of discussion, particularly the Dewey problem-solving sequence.

Cognitive: Knowledge of techniques of discussion, particularly the Dewey problem-solving sequence.

Translation: Demonstrating the techniques of discussion.

Product: Demonstration.

(In this study, students will be taught how to lead a group discussion. There will be a pre and post assessment of this skill with elementary children)

The first short-range objective was to analyze teaching methodology in teaching student teachers teaching skills. The results of the study indicated that when the pre-service teachers were instructed by the method of Explaining and Peer Teaching in using new teaching skills, the most change resulted in their verbal behavior (see Chapter 5).

The second short-range objective was to develop a mini course in the First Strategy of the Taba Model. The mini course is included in the Appendix (p. 116). Since objective one's results were that Explaining and Peer Teaching worked the best, it would be recommended when using the mini course that Explaining and Peer Teaching would be the best teaching method to instruct pre-service teachers.

The third objective was to verify a research instrument Generalization-Specification Scale (p. 55). Results of the study indicated that the scale was not able to be validated. The scale presently is an informal measure of analyzing the information generated by the pre-service teacher and the pupils that the teacher is teaching. Since some of the goals in the Competency-Based Program at Oswego are for self-development and individual progress, the scale does have utility for criterion-based testing. A pre-service teacher could use the scale to measure his/her own behavior and compare that behavior later as he or she progresses in their own teaching development. The scale does have use for the mini course and could be a valuable tool for the person who teaches the module.

The fourth objective was to teach for some specific competencies.

Evaluation by the researcher indicated that the researcher taught toward all competencies that were indicated (see p. 2 of this report). However, the instructor only touched on them and not in any depth. It became extremely apparent to the researcher that competencies are inter-related and that many types of instruction can relate to the same competency.

It would be important here to point out the importance of the collection of diagnostic information on the pre-service teacher that could relate to many competencies. The pre-tape was a valuable tool to look at the pre-service teachers notion of what developing a concept and leading a group discussion was with pupils. Not only did the pre-tape look at those areas, but many other areas could be analyzed, such as behavior, classroom management skills, attitudes, and accepting verbal behavior. Based on this, the researcher would strongly recommend that all pre-service teachers carry out a teaching assignment (the one used in this study is an excellent one) with pupils and record it before they begin Competency-Based Teacher Education. This tape would be kept and could be used continually in a variety of courses throughout the pre-service teacher's training to look at their teaching behaviors. This aspect could be built into the program. Thus, the program would have a pre-test measure.

In collecting the pre-tape, a rater could be hired to analyze the tape via an observation instrument such as a Flanders-22 This cost would be approximately $5.00 per tape. A computer programming system could be set up to generate a matrix and a record of the interaction could be recorded and used as a source for diagnosis and

and prescription. The pre-service teacher could have a folder started in his/her sophomore year and this would provide the record of that person's development. The total cost for the tape, tape evaluation, folder, and computer analysis would be $20.00.

The program could also require that a student would have to make a post-tape in order to exit from the program. The post-tape requirement would be the same as the pre-tape, only using different pupils that the pre-service would teach. Total cost of pre- and post-tape, $40.00. This fee could be collected at the entrance into teacher education programs. Thus, the pre-service teacher would have a pre- and post-test measure that could be used to determine personal growth and development. This measure would also be a useful means of gathering data for evaluation of the Competency-Based Teacher Education program at Oswego.

The campus school where the data was collected for this research was an extremely workable location. It would be important here to point out the researcher attempted to set the research up with a public school district initially and found it virtually impossible because of the problem of logistics. The campus school should be given support, particularly now, because of the uniqueness that it has compared to public schools for research. Crayton Buck deserves tremendous credit for his help in setting up the pupil groups that were used in the study.

Another strong advantage that Oswego has compared to other teacher preparation institutions in collecting data on pre-service teachers is the accessibility of student teachers. The afternoon block of Elementary Education juniors provided the researcher with a set group of students that were easily accessible and all in one place at one time.

The cooperation of the professors in the Elementary Education Department allowed also for specific control that otherwise would have been difficult to acquire. Flexibility in scheduling classes help the researcher treat the two treatment groups and have the control as part of the study. Walter Richmond's finesse at scheduling was truly amazing.

FINANCIAL REPORT

This report is a cost analysis of the expenses which were specific for the study. Since the study was of a two-fold purpose: (1) to fulfill the researcher's dissertation requirements and (2) to identify the relationship of the results of the research to some specific competencies in the new competency-based teacher education program at the State University of New York at Oswego, this report will deal specifically with the expenses that would be typical of a normal research study. Special care was taken to eliminate and not include any of the extra expenses that would be typical of a dissertation study.

EXPENSE	COST
Materials	
Audio tapes (100 @ $.80, 50 @ $.75)	152.50
Dittoes and Paper	29.34
Books	20.00
Postage	6.00
Duplicating	40.00
Phone	40.00
Tape Analysis	
Flanders (22 category @ $5.00/hour)	508.23
(Reliability check @ $15.00/hour)	45.00
Cognitive Map (@ $5.00/hour)	280.00
Typing	
Proposal	43.00
Dissertation	462.50
Computer Service	
Card Punching (@ $5.00/hour)	150.00
Computer Printout	235.00
Statistical Consultant & Programmer (@ $15.00/hour)	300.00
Auxiliary Personnel (@ $2.50/hour)	22.50
TOTAL	$2598.57

A STUDY OF THE RELATIVE EFFECTS OF TWO METHODS FOR DEVELOPING STUDENT TEACHERS' SKILLS IN TEACHING PUPILS USING THE CONCEPT DEVELOPMENT OF THE TABA MODEL

by

Anne Cryan Stewart

B.S., Bucknell University, Lewisburg, Pennsylvania, 1967
M.S., Syracuse University, Syracuse, New York, 1973

ABSTRACT OF DISSERTATION

Submitted in partial fulfillment of the requirements for the
Degree of Doctor of Philosophy in Teacher Education in the
Graduate School of Syracuse University
July, 1975

Approved________________________

Date________________________

The purpose of this research study was to examine the effects of two different methods of instruction of pre-service student teachers in the acquisition of some specific teaching behaviors. This was an experimental process-product study to determine the degree to which the student teachers would acquire the behaviors taught in the two instructions. The criterion measure was the student teachers' performance with elementary pupils.

The first method was "Explaining" which was more than traditional lecturing and the second method was Explaining with the added ingredient of practice "peer teaching."

This study focused on two major questions related to demonstrating differences in the quality of teacher preparation: first, what is the effect of an instructional method based on Explaining?; second, what is the effect of an instructional method which combined Peer Teaching with Explaining? For both questions, the quality of teacher preparation was determined by a measure of teacher-pupil interaction in the area of verbal behavior and content of that verbal behavior.

The population used was sixty-six students from the State University of New York at Oswego and approximately two hundred 7-11 year old pupils from the campus school.

A mini course, the First Strategy of the Taba Model, was the content taught to the student teachers.

The student teacher population was randomly divided into three groups - two treatments Explaining and Explaining and Peer Teaching, and a Control. All students taught pupils to fulfill the pre-tape assignment. The assignment was to lead a group discussion and develop a concept with four or five pupils for fifteen minutes. Then the two treatment groups received instruction from the researcher in the First Strategy of the Taba Model. The Explaining and Peer Teaching group were treated differently from the Explaining group in that they received the opportunity to practice the new skills explained to them by the researcher. At the end of the instruction an audio tape was collected for all three groups with everyone repeating the pre-tape assignment.

The Flanders Interaction Analysis System-22 was used to analyze the student teachers' pre and post teaching behavior. A trained rater scored the tapes and a matrix was formulated for each student. The following areas were analyzed: percent of student and teacher talk time, indirect to direct ratio of teacher talk, percent of accepting verbal behavior of students, percent of questioning verbal behavior of student teachers, percent of factual questions asked by student teachers and percent of pupil questions.

A special instrument was devised to analyze the information generated by the student teachers and pupils during the post-tape assignment. This was called a Generalization-Specification Scale.

An Instructional Rating Survey was administered to the student teachers at the end of instruction to determine the student teachers' perceptions of the researcher's teaching.

A one-way analysis of variance of post-test scores was run on the Flanders Interaction Analysis System-22. When there was a significant value at .05 level, a post hoc comparison of individual means using standard t-test was used. The one-way analysis of variance was also used on the Generalization-Specification Scale. The t-test was also used in the Instructional Rating Survey.

The results showed that the group that received the practice "peer teaching" made significant gains in two areas. They demonstrated significantly superior accepting verbal behavior as compared to the control group at post-tape time. They also improved from pre to post-tape time themselves in the area of questioning verbal behavior. They asked fewer questions at post-tape time than at pre-tape time. Even though they asked fewer questions, the quality of the questions improved. They asked more factual questions than broad or open, thus, meeting one of the requirements for the First Strategy of the Taba Model.

The Explaining group also demonstrated significant changes as a result of the instruction. They demonstrated at post-tape time significantly more accepting responses than the control group. The Explaining group also asked significantly more factual questions than the control at post-tape time and asked significantly more questions from pre to post tape time, thus, showing that the Explaining group improved its quality of questioning.

The Instructional Rating Survey showed that the perceptions of the instructor as determined by the student teachers in the two treatment groups were similar. However, on item 19 the student teachers in the Explaining and Peer Teaching group gave the instructor a significantly higher rating in class discussion than the Explaining group.

There were no significant differences between the two treatment groups on the Generalization-Specification Scale. Other data analysis determined that the student teachers perceived that they had over twice as many control problems than a trained rater observed.

In summary, the instruction appears to have affected both treatment groups. However, the group that received the practice "Explaining and Peer Teaching" had more favorable changes.

A STUDY OF THE RELATIVE EFFECTS OF TWO METHODS FOR DEVELOPING STUDENT TEACHERS' SKILLS IN TEACHING PUPILS USING THE CONCEPT DEVELOPMENT OF THE TABA MODEL

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Grateful thanks goes to the faculty, undergraduates, and pupils at the State University of New York at Oswego who participated in the study. A very special thanks goes to Dr. Dudley Lambert who was the person instrumental in helping to provide the climate for the study. Dr. Crayton Buck and Walter Richmond were particularly helpful in the logistical aspects of the study. Dr. Clarence Trexler, Dr. Mario Rabozzi, Walter Richmond and Dr. Al Wescott also deserve thanks as they gave up their teaching time so the study could be run.

Special thanks goes to a very dear and close friend, Dr. Don Martin, for his patience, support and help in creating the Generalization-Specification Scale, and statistical work; to Dr. Berj Harootinian for his probing questions; to fellow graduate students Ed Awen, Carson Carr, Linda Post, and Wanda McDaniel for their unending support; to Eve Sheedy and Judy Beals for their analysis of tapes and typing; to Dr. Ernest Milner, Dr. David Welton who were the readers.

Since the study was supplemented by funds from both Syracuse University Graduate School and the State University of New York at Oswego, the author wishes to express grateful appreciation to both Universities for the financial help.

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CHAPTER I

INTRODUCTION

STATEMENT OF THE PROBLEM

The purpose of this research study was to examine the effects of two different methods of instruction of pre-service student teachers* in the acquisition of some specific teaching behaviors. This was an experimental process-product study to determine the degree to which the student teachers would acquire the behaviors taught in the two instructions. The criterion measure was the student teachers' performance with elementary pupils.

The first method of instruction was "Explaining." "Explaining is the skill of engendering comprehension--usually orally, verbally and extemporaneously--of some process, concept or generalization. It is the ability to present ideas in such a way that the pupils would be able to respond to questions testing the comprehension of those ideas (Westbury, 1971, p. 177)." Funk (1974, p. 413) defines Explaining as "the act of making intelligible or clear". For the purpose of this research study, it was important to realize that the act of Explaining is different than "lecturing" because it includes not only the act of telling, but also the incorporation of a number of other factors. These factors included a class climate where the student teacher participated via verbal questioning or telling, use of materials which are manipulated by the students, and actual student teacher opportunity to use an observation system to evaluate other student teaching behaviors.

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*Hereafter the use of the term "student teachers" will refer to pre-service student teachers.

The second method of instruction combined Explaining with "Peer Teaching." Peer teaching is the actual practicing of the behaviors by the student teacher using peers as learners. This practice allows for self-analysis, peer analysis, evaluation of other's teaching and supervisor analysis. Peer teaching was an opportunity for practicing the behaviors that have been talked about in the Explaining phase.

Traditionally, teacher preparation institutions have instructed teachers in different strategies of teaching--that ~~is~~, use of a number of skills at one time--by using the method of Explaining. Criticism has been leveled at this method because it only gave student teachers the knowledge of a strategy, but not the enabling skills to demonstrate the strategy with children (Travers, 1973). Also, Explaining did not provide the student teacher with practice or feedback. Traditionally, the student teacher would go out into the field for his/her student teaching experience and not get feedback as to whether or not he/she could demonstrate the strategy. It was more or less expected that the student teacher could perform the skills by just knowing about them.

We do know that we can increase student teachers' knowledge about specific teaching behaviors by the method of Explaining. But what we do not know is - can the method of Explaining enable the student teachers to perform the behaviors of which they have knowledge? It is one thing for a student teacher to know and to recognize a behavior, but the crucial issue is whether the student teacher is able to demonstrate the behavior in such a way that the child's behaviors are changed to meet required performance criteria.

SIGNIFICANCE OF STUDY

The importance of this study for teacher education is considerable. "Competency-based teacher education" is a requirement for some teacher preparation institutions. Those teacher preparation institutions need to know from a logistic, economical and performance competency point of view what method works best in training student teachers in the area of teaching skill development. Since the final measure of competency in the strategy demonstrated in this study was performed with children, this study answered Rosenshine's demand for process-product studies in teacher education (Rosenshine, 1974). The outcomes of the study contribute to identifying performance criteria for demonstration of competency in the First Strategy of the Taba Model (See Appendix A). The Taba Model is an inductive method of teaching. First Strategy refers to Concept Development. The student teacher "learns to use teaching strategies which help pupils become more flexible in their thinking by organizing and reorganizing data: by forming, clarifying and extending concepts, and seeking out relationships among different items of information (Kilgore, 1974, p. 2)."

Research is not only valuable for the narrow area to which it is devoted, but also for whatever else happens to be discovered along the way. Research can provide stepping stone for more knowledge.

This is the case with this study. Not only will the study attempt to answer the questions that it has sought to answer but it will also provide information for further research studies.

A. The study may demonstrate a valuable method "the pre-tape assignment" to look at teaching behaviors before the student teacher receives instruction.

B. The initial data collected on the student teachers' teaching behavior will provide valuable diagnostic information. This sort of information interests researchers who are attempting to determine levels of competency.

A new instrument to measure the post-test quality of the information generated by the student teacher and the pupils was used and may be a useful tool in identifying student teacher competency. This instrument is a Generalization-Specification Scale designed specifically to look at the inductive method of instruction used in the First Strategy of the Taba Model.

Since process-product studies are extremely difficult to carry out in educational settings, this study should pave the way for more studies of this nature. A State University setting with a campus school was the environment for the study. Thus, the study may give validity for the campus school which is typically under fire in some states. Because of cutback in funds and the new demands for teaching centers in public schools based on the consortium notion, campus schools are struggling to survive. The consortium notion refers to the requirement of a teacher training institution and a school district to jointly run a teaching center in the public school. In New York State it is now a requirement. This teaching center would provide the field experience for pre-service and in-service training for teachers from the district.

BACKGROUND INFORMATION

Traditionally, the focus of teacher education has been of an academic orientation. It has been concerned largely with teaching theories, principles, facts and content for the student teacher usually by the method of lecturing. Only toward the end of the academic process has the student received training in the sequence of observation, participation, and student teaching to provide the necessary practice in learning to teach (Association of Teacher Educators, 1971). This traditional method has often not given the student teacher an opportunity to internalize teaching methodology and skills and to demonstrate them prior to teaching in the classroom. Thus, it has been difficult to diagnose any problems the student teacher may have had and to remediate them before he or she enters into classroom teaching. Also, the student teacher has had little opportunity to witness variation in teaching methodology and usually has not acquired a variety of teaching skills. The result has often been that teachers rely on skills that they have become comfortable with or that have worked in some way, regardless of whether or not their skills contribute to student learning.

With the advent of technology (video and audio recorders), mandated legislation from some states in the area of performance-based student teacher educational outcomes, and movement toward behavioral accountability in pupil outcomes in public school systems, the traditional teacher education programs have undergone and are undergoing some drastic changes.

A number of state departments, including New York, are requiring teacher education institutions to design programs of training that emphasize competency in teaching. Teacher training now must include more practice and final demonstration in teaching skills before competency is verified.

The present economic situation of the country, teacher surplus, challenge of tenure, and parent-community concern in the direction of local public education have contributed to the new trend for pupil-behavior-teacher-accountability. Many public officials now feel that desired educational outcomes in student achievement can be specified and measured and that teachers are responsible for student growth. Thus, teacher educational institutions are presently trying to develop teaching behaviors in student teachers that will lead to a healthy climate for pupil learning.

Norman Dodl and H. Del Schalock, in their article which appears in Competency-Based Teacher Education, suggest that "in the next decade professional licensure to teach will be based on demonstrated competencies defined in terms of knowledge, teacher behavior and specified pupil outcomes" (Anderson, 1973, p. 47).

Barak Rosenshine has urged "teacher training institutions" to conduct studies which will fill the gap of knowledge on the relationship between instructional activities and student growth (Rosenshine, 1974). Although Rosenshine was referring to pupil growth (pupil meaning learners in school up to twelfth grade), this study transferred Rosenshine's charge to student teachers' growth. The emphasis here was on filling the gap of knowledge on the relationship between instructional activities in teacher preparation and student teacher growth. The content (First Strategy of the Taba Model) for the instructional activities has already proven successful in stimulating and inducing educational growth in pupils.

The specific teaching behaviors which the student teachers were taught in a mini course were a set of questioning skills called a strategy. The particular strategy (concept development) was the First Strategy of the Hilda Taba Model of inductive teaching. The ability to demonstrate this strategy involved being able to utilize the First Taba Strategy and lead a group discussion and develop a concept with five or six pupils (7-11 year olds).

It is important for the reader to realize that the emphasis in concept development does not focus on higher level questions but rather on factual, recall and descriptive. It is first important to find out what a pupil knows when developing a concept. Factual questions uncover this knowledge. As the teacher progresses through the Taba Model, higher level questions are a necessity for adequate use of the model.

DEFINITION OF TERMS

Definitions utilized in this study include:

1. Peer Teaching. The actual practicing of the teaching behaviors by the student teacher using peers as learners. This practice allows for self-analysis, peer analysis, evluation of other's teaching and supervisor analysis.
2. Strategy. A plan or set of specific teaching skills. The First Strategy of the Taba Model will be used. This strategey involves a set of questioning skills which are used in a particular teaching situation.
3. Explaining. "The skill of engendering comprehension--usually orally, verbally and extemporaneously--of some process, concept or generalization," (Westbury, p. 177). "It is the ability to present ideas in such a way that the pupils would be able to respond to questions testing the comprehension of those ideas" (Westbury, 1971, p. 178). Funk (1947, p. 413) defines Explaining as "the act of making intelligible or clear." For the purposes of this research study, it is important to realize that the act of Explaining is different than "lecturing" because it includes not only the act of telling, but also the incorporation of a number of other factors. They include a class climate where the student participates via verbal questioning or telling, use of materials which are manipulated by the students, and actual student opportunity

to use an observation system to evaluate other student teaching behaviors.

4. Student Teachers. Pre-service elementary education majors who were in the second semester of their junior year (January, 1975) at the State University of New York at Oswego. The students were in the afternoon section.
5. Pupils. Students who attend the campus elementary school at the State University of New York at Oswego. These pupils were males and females, ages 7-11 years old.
6. Competency-based Teacher Education. A program of teacher education where specific competencies are identified for student teachers to demonstrate before they can complete their educational program. These competencies are in the area of knowledge, skills, behaviors, and attitudes.
7. Cognitive Map. A form that the student teacher fills out recording the information that the student teacher and the pupil generate during the time that the student teacher uses the First Strategy of the Taba Model. The quality of the information generated was analyzed by a Generalization-Specification Scale. The map is adapted from the Institute For Staff Development, 1971. (See Appendix B)
8. Generalization-Specification Scale. A measurement designed especially for this study. It is an instrument to discriminate the level of Generalization-Specification content verbal material generated by the pupil's learning through

the steps of the First Strategy of the Taba Model that the student teacher follows. (See Chapter III)

9. Inductive. A process in which one moves from facts of observations to making inferences about relationships among the facts in order to draw conclusions and generalizations from the relationships that have been inferred (Stickel, 1972).

10. 22-Category System. This is a category system to record observations of verbal interaction behavior for the teacher and the student. This system is a subdivided system from the Flanders Interaction Analysis Categories. The system notes teacher talk; identifying indirect talk where the teacher accepts feeling, praises or encourages, accepts or uses pupil's ideas, and asks questions; and direct talk where the teacher initiates the responses by lecturing, giving directions, criticizing or justifying authority. The system also notes pupil talk identifying the nature of the teacher-pupil interaction and identifying pupil-pupil interaction (Flanders, 1970).

11. Teacher-Student Talk Ratio. This ratio is derived from Flanders Interaction Analysis System. It is a computation showing the relationship of subscales representing teacher talk 10, 21, 22, 31, 32, 33, 34, 41, 42, 51, 52, 53, 61, 62, 63, 70 and subscales representing student talk 81, 82, 91, 92 compared to the total classroom verbal interaction.

Dividing the percentage of teacher talk by the percentage of student talk results in the teacher-student talk ratio (Stickel, 1972).

12. Indirect to Direct Ratio. This ratio is derived from Flanders Interaction Analysis System. It is a computation showing the relationship of certain subscales (included in the Interaction Scale) that represent teacher verbal behavior as either indirect or direct. Dividing the sum of subscales 1, 21, 22, 31, 32, 33, 34 and 41, 42 (indirect) by the sum of subscales 51, 52, 61, 62, 63, and 70 (direct) results in the I.D. ratio (Stickel, 1972).
13. EE. This symbol represents the treatment group which received the instruction by the method of Explaining.
14. EEPT. This symbol represents the treatment group which received the instruction by the method of Explaining and Peer Teaching.
15. C. This symbol represents the control group.

LIMITATIONS OF THE STUDY

1. The study involved student teachers from only one State University.
2. The pupils used in the study had to be taught by the student teachers as many as four times which may have affected their behavior when the student teacher taught them.
3. The length of time between the pre-tape time and post tape time may have been too close and affected the pupil's performance as there were noticeable behavior problems during both taping times.

CHAPTER II

REVIEW OF THE LITERATURE

It is important when considering the nature of this research study to read this review of the literature for the following purposes: first, from an historical standpoint to understand the background of needed research in teacher education; second, to understand instructional methods relating to teaching skill acquisition; third from a theory-based and research-based point of view justifying the value of the mini course First Strategy of the Taba Model; fourth, to understand the basis for selection of the instrumentation; and fifth, to understand the justification for the type of procedures used.

Thus, the review of previous articles and studies that seem to be particularly relevant and provide empirical support for this study will cover five areas:

A. Research in Teacher Education

B. Instructional Methods Relating to Teaching Skill Acquisition

C. The mini course - First Strategy of the Taba Model

D. The Measurement Instruments

E. Methodological Procedures

Research on Teacher Education

The Second Handbook of Research on Teaching (1973) devoted a chapter to "Research on Teacher Education." In that chapter Robert Peck and James Tucker from the University of Texas at Austin reviewed journals, books, dissertations, abstracts, and final reports of contract research which constituted the literature for the period of 1955-1971. They claimed two important facts.

> Of the studies reviewed, there were still too many examples of inadequate research design and/or reporting.
>
> Nonetheless, since 1964 there had been a great deal more empirical research performed on one or another operation in the education of teachers than in all the decades before that date.
>
> (Peck and Tucker, 1973, p. 941)

When we consider the history of research on teacher education, indeed it is true that the research has been exceptionally scanty up to 1964. "In 1964 Collier reviewed the strengths and weaknesses of the methods used in studies of teacher education up to that time. He noted that very few studies were experimental in nature." (Peck and Tucker, p. 940)

George Denemark who was past president of the American Association of College Teacher Educators and presently Dean of the School of Education at the University of Kentucky, along with J.B.Macdonald, wrote an article for the Review of Educational Research, 1967, on "Pre-service and In-service Education of Teachers." "They found the available research on teacher education to be extremely scanty and in many areas nonexistent (Denemark and Macdonald, 1967). There was widespread agreement that supervised classroom practice is a good thing for prospective teachers, but there is almost no research to find out how, why or what specific kinds of practice actually do have demonstrably good effects. They observed that "the large grants for teacher education have been given for program development, not for theory, or research". Indeed, they noted that it was almost impossible to identify the theoretical basis for most of the studies reported. They concluded that the most needed next step would be to put large resources (concentrated by implication) into theory-based, complex programs of research and development in teacher education." (Peck and Tucker, 1973, p. 940)

Interestingly, the very things Denemark and Macdonald noted in 1967 are still true in 1975. Teacher education has progressed markedly in program development. Competency-based/Performance-based education programs are now widespread. But money to research its implementation and techniques is not readily available.

Demands of teacher education programs to institute competency-based teacher education are typical in states such as New York and Florida. The very things that Denemark and Macdonald noted in their conclusion in 1967 are of even greater importance today.

Few people attempt experimental process-product studies in teacher education because of their extreme difficulty logistically, and because of the numerous variables that are difficult to control. Dunkin and Biddle in their recent book, The Study of Teaching, (1974, p. 466) stated: "process-process and process-product experiments concerning teaching should be encouraged but preferably for the validation of crucial relationships previously discovered in field surveys or with strong theoretical justification."

It is really the combination of the things just talked about that led up to this research study. The researcher was primarily interested in researching a method of instruction for students teachers in skill acquisition. Since Denemark and Macdonald called for complex research that dealt with theory and program, it was felt that this study was focused on the demands of those educators It is hoped that the experimental nature of this study will contribute significantly to the research in teacher education.

Barak Rosenshine (1971) reviewed over fifty studies that seemed related to teaching behaviors and pupil achievement. His attempt at pooling together those variables has been an important step in research on teaching and are important to this study.

Lambert (1974) summarized Rosenshine's findings:

> 1. There is no evidence to support a claim that a teacher should avoid telling a student that he is wrong; or should avoid giving academic directions. However, teachers who use a great deal of criticism appear consistently to have classes who achieve less in most subject areas. The existing research on teacher disapproval or teacher criticism appears inadequate because insufficient attention has been given to the context in which the behavior occurs.
>
> 2. There was, in four studies, no clear correlation between teacher nonverbal behavior and a measure of student achievement.
>
> 3. Although there was a trend in favor of a positive relationship between teacher approval and pupil achievement, the directions of the correlations are inconsistent from one study to the next. He suggests that certain types and topics of approval may be positively related to achievement, and some forms may be negatively related.
>
> 4. The teacher use of student ideas has not been shown to be a predictor of student achievement, judging by the available research, although there is a trend in this direction.

5. The use of the teacher indirect to direct verbal behavior ratio to predict student achievement appears to have yielded consistently positive but nonsignificant results in favor of indirectness.

6. Achievement-oriented businesslike behaviors on the part of the teacher suggest a significant positive trend for such behaviors in nine studies where these behaviors were rated or counted.

7. Organization of the learning experience proved to be a positive influence in six studies which yielded moderate support for this behavior; correlations for disorganization were negative without exception.

8. Clarity of presentations yielded results that were most consistent and significant in eight studies.

9. Structuring of learning experience yielded significant results; however, variation in low inference measures and difficulty in relating high and low inferenee measures make any conclusions premature.

10. In exploring the types of teacher questions, a small trend was indicated for the importance of factual questions in the learning of mathematics. It is suggested that it may be a total pattern to intellectual stimulation rather than any specific adherence to different patterns of questions that is required to induce growth.

11. Counting variation in behavior or counting frequency of variation in specific activities were explored; specific variations in teacher behavior yielded significant results in three studies in which specific variations in such behavior were counted. In the area of flexibility, seven out of eight studies showed significant results on at least one criterion measure. Whether flexibility was defined as variation in teachers' cognitive behaviors or the richness and variety of classroom materials and activities, the results were consistently significant.

12. Enthusiasm on the part of the teacher was found to be positively related to at least one measure of achievement in five studies rating this behavior, as well as in two additional experimental studies."

(Lambert, 1974, pp. 15-17)

The variables of teaching behavior and student achievement that Rosenshine disucssed in his review are typical of some of the behaviors in the First Strategy of the Taba Model. Therefore, they are important for this research.

At the Competency-Based Teacher Education meeting held at the Hotel Syracuse in the Spring of 1974, Rosenshine in his key note address challenged teacher educators to do research on instructional activities and pupil achievement. He set up a plan for the research requesting that each teacher training institution do one study a year.

At this conference, Rosenshine's audience was concerned primarily with the problems of competency-based teacher education. Typical questions raised were: How do you identify performance criteria for competency? Does a student teacher who learns a skill have to be able to make a difference with pupil's behavior in order to verify his own competency?

This study does not meet Rosenshine's challenge with reference to pupil learning but rather, views the performance of the student teacher following skill instruction.

The New York State Board of Regents' statewide plan for post-secondary education stated a goal for the preparation and practice of professional personnel in the school. The goal is as follows:

> To establish a system of certification by which the State can ensure the public that professional personnel in the schools possess and maintain demonstrated competence to enable children to learn.
> (American Association for College Teacher Educators, New York State, 1973, p. 3)

Every teacher preparation institution in New York State during 1975 had to submit a program of teacher education which would achieve the Regents' goal.

Syracuse University identified competencies that student teachers were required to fulfill in order to exit the program. Those competencies were identified in the following areas: Knowledge, skills and behaviors, and attitudes (Thornfield III).

During the fall and spring semesters 1974-75, the courses for juniors and seniors at Syracuse were set up on a mini course sequence. For the skills area several models of teaching were taught and some of the measures of competency in the models were demonstrated with pupils. However, up to this point a researched instrument for the specific purpose of measuring competency hasn't been developed, nor have the performance criteria been identified. Thus, identifying specific exit requirements that are of a competency nature is a necessary task. This is a common problem all over the country with other teacher preparation programs.

The researcher considered Denemark and Macdonald's requests, Rosenshine's research and speech, and the problems with new competency-based teacher education programs and made an attempt to pull together a research study that was important for all three.

Since ideally teacher preparation programs want student teachers to learn skills so that they can make a difference with pupils, the researcher decided to focus the study on the methods of training student teachers in a specific set of skills (First Strategy of the Taba Model). The measurement of the competency of the skill then would be determined by the student teachers' performance with pupils. Thus, the research was an experimental, process-product study dealing with instructional methods in skill acquisition and relating to performance with pupils.

Instructional Methods Relating to Teaching Skill Acquisition

The researcher reviewed over fifty studies which dealt with instructional methods relating to teaching skill acquisition. These studies dealt primarily with instructional methods such as microteaching, peer teaching and student teaching. None of the studies reviewed compared the instructional method "Explaining" with "Explaining and Peer Teaching." Interestingly enough, very few dealt with lecturing which has been the commonly used method for over fifty years.

Studies which dealt with acquisition of teaching skills were typically based on the microteaching method. Microteaching is defined as a scaled-down teaching situation where teaching skills of teachers could be developed with pupils with feedback from a supervisor and a reteach method established. Allen, etal. (1969) in their book, Microteaching, suggest that microteaching is an important vehicle for fostering development of specific skills. One research study done by Hinchley (1972) showed that when comparing microteaching and peer teaching in relation to subsequent teaching success, there was no difference in the outcomes. Peer teaching is the actual practicing of teaching behaviors by the student teacher using peers as learners. Based on Hinchley's results, and since microteaching is a much more time consuming and costly method of instruction, the researcher decided to use peer teaching as one method to be studied. Cruickshank (1971) suggested that peer teaching has a particular advantage in teacher education programs because it allows for practice, participation, remedial help for those having difficulties, feedback and self-analysis.

Review of the literature in the area of peer teaching suggested that it is a promising method of instruction. Peer teaching in elementary schools in tutoring situations showed that the tutor and tutee improved significantly in the area where they were jointly working (Rosenbaum, 1973).

The peer teaching in this study included the element of feedback from peers. A research study by Steiner (1967) found that any one of three methods of providing feedback to student teachers of mathematics increased their skill, as compared to a control group. Feedback from fellow student teachers working in pairs, and feedback from pupils were both found to be more successful than self-appraisal feedback by the student teachers themselves as they modified and retaught lessons (Travers, 1973).

Peer teaching is an act of simulation which allows for practice and provides a climate which is free from many other essential features of classroom teaching. Those other essential features in the classroom could take up more teaching time and demand more skills than the student teacher can demonstrate.

Since none of the fifty articles reviewed were devoted to the instructional method "Explaining," the researcher looked specifically into studies comparing instructional methods.

A review of studies comparing instructional methods to each other reveals five studies done comparing lecturing with another means of instruction. Lecturing was the only method which came close in definition to Explaining. Unfortunately, none of the five articles dealt with acquisition of teaching skills, or were compared to Explaining and Peer Teaching.

A typical example of one of the five studies is as follows: A study done by Blackman (1971) dealt with Effectiveness of Programmed Instruction versus the Lecture-Discussion Method of Teaching Basic Metallurgical Concepts. The results were that programmed instruction was as effective as the lecture-discussion. This study dealt with method of instruction for pupils and pupil achievement.

Westbury and Bellack (1971) discussed four studies relating to "exploring teacher's effectiveness in lecturing." Their defining of Lecturing evolved during this study to mean Explaining as mentioned earlier in Chapter I. These four studies dealt specifically with explorations of the teacher's effectiveness in Lecturing as judged by pupil ratings.

The teacher's "Effectiveness of Explaining" was operationally defined as the ability to present ideas in such a way that the pupils would be able to respond to questions testing the comprehension of those ideas (Westbury and Bellack, 1971, p. 178). The effectiveness was judged by pupil ratings. The studies are important because they look in depth at the Method of Explaining. For the purposes of this study, they do not provide much information as to the relationship of the method of acquisition of specific behaviors and therefore are not discussed in detail.

There appears to be a lack of research on the method of Explaining and its relationship to teacher skill acquisition. Thus the researcher felt more justified to examine closely the historically accepted method of instruction, "Explaining," as it pertains to teacher skill acquisition.

The Taba Model

Currently, one of the themes of educational research is "what teaching behaviors affect pupil achievement?" Hilda Taba, who was an eminent thinker, writer, professor, teacher educator, curriculum coordinator, and researcher on children's thinking, did just the type of study that Rosenshine had hoped to see increased. Based on research and influenced by Piaget, Taba developed an inductive information-processing model. The model was an accumulation of questioning skills which, if a teacher used correctly, would develop the thinking skills of pupils and also give the pupils a more humanistic, personalized process of internalizing knowledge. After a lengthy study in which in-service teachers in the San Francisco area were trained in the Taba Model, Taba found that pupils taught by the teachers trained in the Taba method did significantly better on the STEP achievement tests than those in the control group (Taba, 1966). The cumulative research that Taba did specified the following:

1. Thinking skills can be taught.
2. Thinking involves an active transaction between an individual and the data with which he is working. Data becomes meaningful only when an individual performs certain cognitive operations upon it.
3. The ability to think cannot be "given" by teachers to students. How well an individual thinks depends on the richness and significance of the content with which he works, as well as the processes he uses, and the initial assistance he is given in the development of such processes.
4. Precise teaching strategies can be developed and utilized which will encourage and improve students' thinking.
5. All school children are capable of thinking at abstract levels, although the quality of individual thinking differs markedly.
6. All subjects offer an appropriate context for thinking.
7. Since thinking takes many forms, the specific thinking processes to be developed should be clear in the teacher's mind. (Institute for Staff Development, 1971, p. 147)

An entire company, The Institute for Staff Development, was developed for the purpose of training in-service teachers in the Hilda Taba Teaching Strategies. They state that the most marked single influence on cognitive performance of pupils seemed to reside in the impact of the teaching strategies (Institute for Staff Development, 1971).

Stickel (1972) studied the Effects of the Hilda Taba Teaching Strategies Program on Verbal Behavior and Attitudes of Teachers. His study found that, after using the Hilda Taba Teaching Strategies Program (Institute for Staff Development), there were positive changes in both teachers' verbal behavior and teachers' attitude. The teachers' verbal behavior became more indirect than direct, and teachers became more accepting of pupil ideas on the Flanders Interaction Analysis System.

Models of Teaching (Joyce and Weil, 1972) is an attempt to show different examples of teaching strategies. Joyce devoted an entire chapter to the Taba Model. Joyce felt that the Taba Model was an information processing model and of important value in learning teaching strategies. Based on Joyce's book, Syracuse University, in its new performance-based teacher education program, is offering the Taba Strategies as one of the optional requirements for a student teacher to demonstrate competency before completion of the teacher training program (Thornfield III report). The Taba Strategies are broken down according to three specific levels. It was decided that for the purposes of this research study, the first strategy would be particularly significant for student teachers since not only does it stress development of three types of questioning skills, but it also stresses development of a concept, ability to lead a group discussion, and an accepting attitude toward children. Thus, the first strategy is a very important step in skill training of student teachers in meeting specific performance-based competence.

The Taba Strategies have been extensively used by the Institute for Staff Development to train in-service teachers, but according to Alvah Kilgore, a Taba instructor from the Institute, little training has been done for pre-service teachers.

Some performance objectives have been set up by the Institute for Staff Development for the First Strategy for in-service teachers. They are as follows: Increase student talk to at least 50 percent of the discussion time; maintain a 10-1 ratio of teacher-asking to teacher-telling. (Institute for Staff Development, 1971, p. xii)

The percent of student talk time was analyzed in this study by the FIAS-22. Student teachers were told during the mini course that ideal percentage of teacher-pupil talk time was 50 percent of the discussion. This statement was based on the Institute's performance criteria for in-service teachers.

In the mini course the students were also taught an observation instrument to record their own teacher-ask, teacher-tell ratio and pupil-ask, pupil-tell ratio. Institute for Staff Development uses this procedure in training in-service teachers.

The mini course content was based on Taba's Teachers' Handbook for Elementary Social Studies, (1967) and the Institute for Staff Development manual Concept Formation (1971). The First Strategy of the Taba Model, Concept Formation, is developed by a series of steps, one being the prerequisite for the next. A brief description of the Taba Strategy is as follows:

> Concepts are formed as students respond to questions which required them: (1) to enumerate items; (2) to find a basis for grouping items that are similar in some respect; (3) to identify the common characteristics of items in a group; (4) to label the groups; and (5) to subsume items that they have enumerated under those labels. In this process they must differentiate the various items from each other and decide on the basis of groupings, what the categories are to be, and which items are larger and which are smaller (or what is superordinate and what is subordinate).
> (Taba, 1967, p. 92)

The Institute for Staff Development recommends that the mini course for Concept Development, First Strategy of Taba Model, be taught in a fourteen hour course for in-service teachers. The course time should be broken down as follows: "Two hours introduction, six hours preparation and try out, two hours skill refinement and extension and four hours application." (Institute for Staff Development, 1973) The researcher, in this study, decided to delete some of the material that the Institute for Staff Development used and run an eleven hour mini course - one hour pre-tape, nine hours class instruction, one hour post-tape. Based on the recommendation from Alvah Kilgore, the Taba trainer from the Institute for Staff Development, and considering the fact that student teachers were a different population than in-service teachers, the course was shortened. The statements just discussed should give support and justification for the procedures and use of the First Strategy of the Taba Model in this research study.

Measurement Instruments

Some of the objectives of the First Strategy of the Taba Model were to bring about changes in teachers' verbal interaction patterns with pupils. One purpose of the change was to develop higher level thinking skills with pupils as they dealt with significant concepts. This was accomplished by teaching the teacher to use specific questioning skills. A second purpose was to have the teacher become more accepting of pupils' responses, to be able to redirect questions and to create an atmosphere wherein the student responded of his own volition.

Flanders Interaction Analysis System (FIAS-10) was used in Stickel's (1972) study to measure the teacher-pupil verbal interaction patterns on a consistent basis. As previously mentioned in this chapter, his study found that, after using the Hilda Taba Teaching Strategies Program (Institute for Staff Development), there were positive changes in both teachers' verbal behavior and teachers' attitudes. With the FIAS-10, Stickel was able to look at indirect direct teacher talk ratio, accepting teacher behavior, teacher talk time, pupil talk time, teacher asking, and other areas.

Simon and Boyer's Mirrors of Behavior: An Anthology of Classroom Observation Systems (1967, 1970a, 1970b) identified seventy-nine classroom observation systems. These systems were designed to look at the climate of classroom situations. The instruments dealt with the following: social and emotional climate, non-verbal behavior, verbal behavior, pupil-pupil interaction, teacher-pupil interaction, and content of information generated in the classroom. Because the Flanders Interaction Analysis-10 looks at the verbal interaction of pupils and teachers, it has become a well used system. It is frequently used in a comparative nature to other studies.

"The use of some form of interaction analysis to clarify differences between the experimental and control groups depends on a logistical relationship which presumably exists between 'the treatment' and teacher-pupil interaction." (Flanders, 1970, p. 11) Since in the Taba Strategies the verbal behavior of the teacher should meet specific requirements, the FIAS-10 is a good measure to identify if those requirements are met. The FIAS-10 looks at the teacher-pupil verbal interaction.

Flanders (1970) indicated that as reliability of coders of FIAS-10 was being developed, a need arose to subscribe categories. Coders in discussing teachers' statements, found that it was difficult to make decisions when various statements could be coded under one category. Through the coders' records of their discussions, the FIAS-22 was developed. The Flanders Interaction Analysis-22 is a much more sophisticated system than the FIAS-10. It is simply an expanded version of the FIAS-10, thus allowing for the 10 categories to be subscribed. (See Appendix C and Chapter III.)

Very few studies have been done which use this system because it is difficult to learn and code. Long (1971) who will be mentioned in the next section of this review under Procedures and Slade (1975) are two researchers who used this procedure. Slade (1975) studied "The Apparent Effects of a Specific In-service Program on Teachers' Perceptions and Classroom Behaviors." The goal of the program was for the participants to adjust their classroom behavior as they became more aware of each student's particular style of learning. Slade used the FIAS-22 to analyze pre to post changes for the teachers in I/D ratio, i/d ratio, percentage of teacher talk and percentage of student talk. Results were that no significant changes occurred in the participants' classroom behavior as measured by the FIAS-22. This was a descriptive study, and in Slade's final recommendations, she continued to recommend and support the FIAS-22 to test the assumptions made in her study about verbal behavior in a classroom with an individualized program.

Since the FIAS-22 can identify those verbal interaction patterns with teachers and pupils which research has validated as more conducive to effective functioning in the classroom including higher student achievement (Stickel, 1972; Taba, 1967), it was decided to use the expanded Flanders Interaction System (FIAS-22) in this study.

This study is also similar to Stickel's and the researcher felt a need to use a measure which another researcher had used before in identifying behavior changes dealing with the Taba Strategies.

The sophistication of the FIAS-22 and the fact that it has the capacity to be collapsed into the FIAS-10, thus to be used in a comparative manner, makes the instrument favorable for this study.

Other Measures

The need to prepare instruments to define performance criteria was recommended by a distinguished committee formed to report on national program priorities in teacher education. (Rosner, 1972, p. 30).

Stickel (1972) stated a need for the development of measures of evaluation which would be more closely related to the specific objectives of the Taba Strategies. For example, it would be valuable to be able to assess the quality of teacher-pupil interaction in terms of the content pursued and the specific categories of the Taba Model. It was the attempt of the researcher in this study to develop a measure which would be related to the Generalization-Specification of the content in teacher-pupil interaction. It was hoped that this instrument would lay the ground work for a tool to measure performance criteria.

A table of Generalization-Specification was developed specifically for this study and will be discussed in detail in Chapter III. Its purpose is to measure *the quality of the information that the* teachers were able to generate from the pupils while using a set of teaching skills, First Strategy of the Taba Model. "The problem of trying to link teacher behavior to student outcomes is an extremely challenging one, and it will be met only if the pre-service measures of teacher competence are of adequate reliability and validity." (Quirk, 1974, p. 319). The researcher is well aware that this Generalization-Specification Scale is in the infant stage of development and much further research will be needed for it to become valid and reliable.

Methodological Procedures

Audio Tape

In the past few years, educational researchers have begun investigation of some of the most pressing methodological problems associated with the use of behavior category systems for observing classroom teacher-pupil verbal behavior. John Long (1971) studied "The Effects of the Medium Employed in the Codification Process Upon Verbal Interaction Data." The medium were live, audio tapes, video tapes, and transcripts. The results of his study found that there were few differences between data obtained via live, audio and video tape observations. However, data obtained using a typescript was quite different from the other three medium forms. Thus, based on Long's study, and from an economical point of view, it was decided that audio tapes would be used as the medium to collect the data.

Summary

Four bodies of literature have been reviewed in this chapter.

1. Research in teacher education was discussed from an historical perspective. Denemark and Macdonald, Rosenhine, and the new concept of Competency-Based Teacher Education were highlighted to give the background for the study.

2. Instructional methods relating to teaching skill acquisition were reviewed. This dealt with studies done that used the methods such as microteaching, peer teaching, lecturing and explaining.

3. The review of the Taba Model gave justification to its use in the mini course because of the effects on pupil achievement when the Taba teaching strategies were employed.

4. The FIAS-22 was discussed and reasons given for its use, based on Stickel, Slade and Long studies. The Generalization-Specification Scale was introduced based on Stickel's recommendation.

5. Justification of methodological procedures to use audio tapes to collect data was based on Long's study.

CHAPTER III

RESEARCH DESIGN AND PROCEDURES

This chapter contains a description of Questions, Hypotheses; Sample; Design, including general procedures, design for measures, data collection, data analysis and additional data analysis; Instrumentation.

Questions

This study focused on two major questions related to demonstrating differences in the quality of teacher preparation: first, what is the effect of an instructional method based on Explaining?; second, what is the effect of an instructional method which combined Peer Teaching with Explaining? For both questions, the quality of teacher preparation was determined by a measure of teacher-pupil interaction in the area of verbal behavior and content of that verbal behavior.

The three groups compared are two treatments and one control. The treatments are: one group who was taught the mini course by the method of Explaining; one group who was taught the mini course like the first treatment but with an added ingredient - the element of practice "Peer Teaching." The control group took the regular curriculum.

Hypotheses

The major hypotheses are stated in their null form.

Hypotheses $1_{a,b,c,d}$ - Percentage of Pupil Talk

H_{1a} There will be no significant differences among the three groups in mean percentage of pupil talk as measured by the FIAS-22 on the post-test.

H_{1b} There will be no significant differences between pre and post tests in mean percentage of pupil talk time as measured by the FIAS-22 in the Explaining group.

H_{1c} There will be no significant differences between pre and post tests in mean percentage of pupil talk time as measured by the FIAS-22 in the Explaining and Peer Teaching group.

H_{1d} There will be no significant differences between pre and post tests in mean percentage of pupil talk time as measured by the FIAS-22 in the Control group.

Hypotheses $2_{a,b,c,d}$ - Ratio of Teacher Responses That are Indirect

H_{2a} There will be no significant differences among the three groups in mean ratio of teacher responses that are indirect compared to direct as measured by the FIAS-22 on the post-test.

H_{2b} There will be no significant differences between the pre and post tests in mean ratio of teacher responses that are indirect compared to direct as measured by the FIAS-22 for the Explaining group.

H_{2c} There will be no significant differences between the pre and post tests in mean ratio of teacher responses that are indirect compared to direct as measured by the FIAS-22 for the Explaining and Explaining and Peer Teaching group.

H_{2d} There will be no significant differences between pre and post tests in mean ratio of teacher responses that are indirect compared to direct as measured by the FIAS-22 in the Control group.

Hypotheses $3_{a,b,c,d}$ - Percentage of Responses by Teachers That are Accepting

H_{3a} There will be no significant differences among the three groups in mean percentage of number of responses by teachers that are accepting as measured by FIAS-22 on the post-test.

H_{3b} There will be no significant differences between the pre and post tests in mean percentage of number of responses by teachers that are accepting as measured by the FIAS-22 for the Explaining group.

H_{3c} There will be no significant differences between the pre and post tests in mean percentage of number of responses by teachers that are accepting as measured by the FIAS-22 for the Explaining and Peer Teaching group.

H_{3d} There will be no significant differences between the pre and post tests in mean percentage of number of responses by teachers that are accepting as measured by the FIAS-22 for the Control group.

Hypotheses $4_{a,b,c,d}$ - Percentage of Teacher Responses that are Asking

H_{4a} There will be no significant differences among the three groups in mean percentage of teacher responses that are asking as measured by FIAS-22 on the post-test.

H_{4b} There will be no significant differences between the pre and post tests in mean percentage of teacher responses that are asking as measured by the FIAS-22 for the Explaining group.

H_{4c} There will be no significant differences between the pre and post tests in mean percentage of teacher responses that are asking as measured by the FIAS-22 for the Explaining and Peer Teaching group.

H_{4d} There will be no significant differences between the pre and post tests in mean percentage of teacher responses that are asking as measured by the FIAS-22 for the Control group.

Hypotheses $5_{a,b,c,d}$ - Percentage of Pupil Responses that are Asking

H_{5a} There will be no significant differences among the three groups in mean percentage of pupil responses that are asking as measured by FIAS-22 on the post-test.

H_{5b} There will be no significant differences between the pre and post tests in mean percentage of pupil responses that are asking as measured by the FIAS-22 for the Explaining group.

H_{5c} There will be no significant differences between the pre and post tests in mean percentage of pupil responses that are asking as measured by the FIAS-22 for the Explaining and Peer Teaching group.

H_{5d} There will be no significant differences between the pre and post tests in mean percentage of pupil responses that are asking as measured by the FIAS-22 for the Control group.

Hypothesis 6 - EE and EEPT Generalization-Specification Scores

H_6 There will be no significant differences among the two groups, EE and EEPT, in mean Generalization-Specification scores on the post-test as measured by the Generalization-Specification Scale.

Sampling

Student Teachers

The population consisted of all elementary education majors, male and female, who were in the second semester of their junior year at The State University of New York at Oswego, Oswego, New York. For the purposes of this study, they were referred to as student teachers.

The sample consisted of those students who were registered for the afternoon section of Course No. 396 (9 hours in Methods) during the January 1974 spring semester at SUNY at Oswego. The total number was sixty-six.

During the first class session with the researcher, they were required to fill out an information form (See Appendix D). The results of the information form are as follows. The student teachers ranged in age from 19-25 years. Most of them were 20 and 21 years of age. There were ten males and fifty-six females. All had over sixty hours of college credit, most totaling eighty to ninety hours; fourteen, however, had over ninety hours of credit. Twenty-seven indicated they had some teaching experience such as in scouting or church work. Thirty-nine indicated they had never taught before. All students expressed a strong interest to teach at the elementary level.

These students had completed only one course in education. It was a four hour course in Foundation in Philosophy and History of Education. During this course they experienced one hour of credit in observation in the campus school. This observation totaled twenty to forty hours.

Pupils

Since the student teachers were required to teach to pupils, it was important to select a pupil population that was accessible and researchable. The campus school at SUNY at Oswego was selected.

The procedure for the pupils to enroll in the campus school at the beginning of the school year was determined by the following method. After all the students had applied, they were selected by lottery. The pupils come from the City of Oswego and rural areas surrounding the city. The present population includes thirty-five percent whose parents are associated with the college as a teacher, maintenance staff, business, etc.

The sample for this research included all seven through eleven year old pupils (approximately 200 pupils) who were in the normal curriculum. Special education students were not included.

Design

General Procedures

To investigate the questions and hypotheses stated, the researcher proceeded in the following manner.

1. Policy Statement

A general meeting was held for all the student teachers who signed up for the No. 396 Methods course. At this meeting the chairman of the Elementary Education Department, Dr. Clarence Trexler, gave a policy statement to the students regarding the research (See Appendix E) and introduced the researcher. The policy statement lead the students to believe that the researcher was working jointly with four other professors involved in the Methods course and that the student teachers were part of a project for competency-based teacher education. They thought the researcher's purpose was to help Oswego develop learning modules. At no time during the entire study did the researcher explain the real purpose of the study, nor did the other professors involved. Toward the end of the data collection a couple of students indicated that they felt there was a control group and that they were in a treatment group.

2. Groups

To investigate the questions and hypotheses, three groups were chosen. There was an experimental group which received the method of Explaining in the mini course as its treatment. This group was designated EE. There was a second experimental group which received Explaining and Peer Teaching in the mini course as its treatment. This group was called EEPT. There was a control group which took the regular program at State University of New York at Oswego. This group was called C. The regular program was the nine hour course in which the students were involved. This course was divided up into sections A, B, and C. Each section took so many hours of science, social studies, math and language arts. While the treatment groups A and B took the mini course, C took the other courses. After the research, C got the mini course and A and B took the other courses. The purpose of this was to make sure that A, B and C did not think they were being treated too differently.

3. Student Teacher Group Placements - Lottery Method

Before the general meeting, the researcher was given a list of all the student teachers who had signed up for the Methods course at registration. Every student on the list was given a number. The numbers were placed in a bag and shuffled. The researcher drew out a number for each of the three groups that were to be researched until all the numbers were gone. The student teachers were then assigned to each of the three groups. The groups were called A, B, and C. The students did not know A really represented EE, B equalled EEPT and C was the control group. A, B and C was also the name of the section that the student teachers were in for the nine hour course.

Since there were some dropouts from the total number of students originally signed up, the groups were not totally balanced. A = 21; B = 24; C = 21. Total number of students in the study was sixty-six.

4. Pre-Tape

During the general meeting, the student teachers were told that they had to complete an assignment before their first class session with the researcher. Instructions for the assignment were given to the three groups. They were as follows:

> You will be required to lead a group discussion and develop a concept of your own choice with an assigned group of five or six. elementary pupils from the campus school for a period of fifteen minutes. An audio-tape of your session will be collected. An outline must be handed in at that time which states the concept and procedure for carrying it out. The concept can be from any area. (See Appendix F).

Since the pre-tape was to be compared to the post-tape, no formal instruction was given as to the nature of the assignment. When the researcher was asked specific questions about the assignment, she told the students she wanted to see how they thought a group discussion should be lead and what they thought a concept was.

The students were given a schedule that told them the time and place to carry out the assignment and the age group of pupils they would be teaching.

The researcher gave the class instructions in using the tape recorders and cassettes and some suggestions as to dealing with the children.

A. Introduce self to children

B. Put name tags on the pupils

C. Talk with pupils before starting lesson

D. Tell pupils that they are being recorded

5. Recorders and Cassettes

Five Sharp-RD-473UM tape recorders were used. These recorders were selected because of their automatic built-in condenser microphone. The built-in microphone reduced the problems in recording that a standard recorder with a microphone attachment would propose. Realistic C-30 Compact Cassettes (Radio Shack) were used. These cassettes had advertised 15 minutes of tape per side. However, in some cases the tapes had 16 minutes.

6. Pupil Placement

A special system of placement was used to organize the groups of pupils the students were to teach. The campus school principal, Dr. Crayton Buck, and the researcher worked on this placement. The placement was not of a random nature, but biased to control for the following: equal balance of sex and age of the pupils in each group, frequency the pupils were taught, heterogeneous grouping according to ability of the pupils. The following method was used. Pupils were selected from their class list. They were originally placed in their class heterogeneously according to ability. In most groups three boys and three girls were chosen. The pupils ranged in age from seven to eleven. Three boys and three girls were chosen for every age level. Then a code was given to each group. (See Appendix G)

Special checks were made in the scheduling for the following:

A. Each treatment group and the control, at pre and post time had an equal number of seven to eleven year olds.

B. No student teacher taught the same groups of pupils twice.

C. No group of pupils was used more than four times.

7. Treatments

The two treatment groups were given a mini course on the First Strategy of the Taba Model. All professors who were involved with the student teachers in the nine hour Methods block were requested not to teach any of the content information that the researcher would be using in the Taba mini course. Any student who missed the class session was given instruction outside of class in a special session. The purpose was to attempt to keep the number of student teachers high for each group. While the two treatment groups received instruction, the control group took the regular Methods course from the nine hour block.

A. Explaining (EE)

Treatment group EE (Section A for student purposes) received nine hours of a mini course (See Appendix H) in the First Strategy of the Taba Model by the method of Explaining. All students in this group did the pre-tape assignment before the mini course instruction. The researcher taught the mini course.

This mini course content included the following: basic theory behind Taba's teaching strategies, research to support the Taba Model, discussed concept, strategy, and how to lead a discussion, taught observation tool to analyze teacher-pupil verbal behavior. Students analyzed their own pre-tapes with this instrument, researcher demonstrated the First Strategy of the Taba Model, had the students use observation instrument when listening to a tape of another person using the Taba Model, and discussed the method of using the cognitive map.

The researcher used the required behavior which was defined in Chapter I of the method of "Explaining."

The students were told that they could freely discuss and ask questions at any time during the mini course. A good percentage of the class time was of a discussion nature. The students were allowed to use an observation instrument and amlyze their own and other's teaching behavior.

B. Explaining and Peer Teaching (EEPT)

The treatment group EEPT (Section B for student teacher purposes) also received nine hours of instruction in the mini course.

All students in this group did the pre-tape prior to the mini course instruction (See Appendix I). This course content was virtually the same as EE's except for the following. The length of time in covering the content was shortened so that for this treatment group, the following could occur. This Explaining and Peer Teaching group received time to practice the behaviors they were told about. A two-hour peer teaching situation was set up. Each student was permitted to choose a group of three or four of his peers. Each student had to teach the group two times, for fifteen minutes, developing a concept and leading a group discussion with the specific behaviors in the First Strategy of the Taba Model (See Appendix A). The groups gave feedback to the student as to his degree of success. The peers filled in the cognitive map while the teaching by the Taba Model was occurring. They were allowed to use any concept they wanted during the two instructions.

8. Post-Tape

After instruction was completed for the treatment groups, all the student teachers involved in the study went to the campus school and repeated the pre-tape assignment. (See Appendix F). This time however, they were required to teach to a different group of pupils and use a new concept. The two treatment groups, Explaining and Peer Teaching, were told to use the First Strategy of the Taba Model that they were taught in the mini course and to fill out a cognitive map recording the information that they generated with the pupils. This was handed to the researcher at the end of the post-taping.

The post-taping scheduling for the three groups EE, EEPT and C was controlled so that there would be a balance between length of time from pre to post (See Appendix I). The average days between pre and post were: EE = 13; EEPT = 12; and C= 14.5.

Design for Measures

For hypotheses 1-5 the basic design is a one-way analysis of variance. The design is a comparison of three groups using pre and post measures.

Group	Pre	Post
EE Explaining		
EEPT Explaining and Peer Teaching		
C Control		

For hypothesis 6 the basic design is a one-way analysis of variance, one dimension being the post-test and the other being the two treatment groups.

Group	Post
EE Explaining	
EEPT Explaining and Peer Teaching	

Data Collection

Both pre and post audio tapes and post cognitive maps were collected immediately after the taping sessions. The audio tapes were labeled with a code number and pre and post tapes were mixed together.

FIAS-22

A rater was hired and trained in the FIAS-22. (Judy Beals, Jay Street, Chittenango, N.Y. She is a housewife and has had three years of college preparation.) Eleven hours of training occurred using the Flanders (1973) text Analyzing Teaching Behavior, and Amidon and Flanders (1963) text A Manual for Understanding and Improving Teachers' Classroom Behaviors. The rater had no knowledge of the purpose of the study or the questions the researcher was asking.

The researcher established a .92 inter rater reliability between herself and the rater by collapsing the FIAS-22 into the FIAS-10 and found an intra rater reliability with the FIAS-22 of .87 before the official rating of the tapes was started by a commonly used modification of the Scott's Coefficient (Stewart, 1974).

During the rating of the one hundred twenty-two tapes, the following procedure was followed for rating and continued reliability checks. The following five points were the basic criteria for rating the tapes:

1. Listen to the entire tape
2. Rate for five minutes on most difficult part or on five minutes segment - chosen arbitrarily
3. Rate entire tape recording every three seconds on the type of verbal behavior heard, or whenever a verbal behavior change is noticed.

4. Keep each ten tapes separate. Pick at random one tape from each group of ten, rerate that one to check reliability.

5. Record code numbers, names of teachers, data rated on corresponding rating pages.

After rating the first group of ten tapes the rater noticed the following variables: discipline problems, poor tape quality, lack of teacher direction, second taping. It was then decided that the rater would indicate on the scoring sheets if those variables occurred. Those variables were defined as:

A. Discipline problems - one or more of the following behavior patterns occurring regularly throughout the tape, or to the point that the teacher was not able to complete the lesson: talking nonsense, making noise into the microphone, obvious rudeness, talking all at once, vulgarity, student dominated discussion completely unrelated to the subject introduced, other student noises that made hearing and accurate rating difficult. The teacher would either make no attempt to control the children or wasn't able to.

B. Poor tape quality - tape was difficult to listen to, static, voices low, mumbled noises.

C. Lack of teacher direction - Teacher let pupils talk on and on, was unable to redirect the discussion, pupils went off on tangents without teacher control.

D. Second taping - during the pre-tape time, three students in group C forgot to push play and record, thus, they had to make a second taping. They did so but used a different group of children.

The reliability checks using the Scott's Coefficient (Scott, 1955) were run on the twelve ratings, the lowest score being .33, and the highest .90. The mean was .78 for the twelve checks. When the low score .33 was removed the mean became .82. Of the twelve checks, six were above .82. Since the .33 is atypical as compared with the other checks, it should be considered a suspect score.

Two other intra-rater checks were made on tapes that were identified as poor tape quality. The purpose of these checks was to determine if the rater was rating reliably in cases where auditory discrimination was a problem. The tapes were chosen at random from the total group of tapes that were identified as poor tape quality. The reliability scores were .70 and .87.

According to Flanders (1970) and Slade (1975), the fourteen checks of intra-rater reliability were acceptable and the rater showed strong consistency with her own ratings.

Three inter-rater reliability checks were done with an outside rater, Dr. Deborah Slade, Bethany College, Bethany, West Virginia, who was trained in the FIAS-22, for the purpose of seeing how generalizable the results of the study would be.

Three tapes were chosen at random from all the tapes and were coded. The outside rater followed the same rating procedures as the hired rater. Again, the Scott's Coefficient was used. The three checks were .48, .11, and .08. Two basic reasons may explain the poor reliability. First, the three tapes chosen happened to be poor tape quality. Second, the hired rater rated one-third more ratings per minute than the outside rater.

Since the reliabilities are quite low, it would be necessary if the study were to be compared to other studies, to have another outside rater rate some of the tapes and reliability checks done.

Generalization-Specification Scale

The scoring procedure for the Table of Generalization-Specification was as follows. A rater was hired to listen to the forty-three post-tapes and record in the appropriate places any information which the student may have left off the cognitive map. The post-tapes were from the two treatment groups EE and EEPT. There were nineteen subjects in EE and twenty-four in EEPT. The rater then applied the formula to the cognitive map (See Appendix J). The researcher also applied the formula to the maps and scores were compared. It was assumed that if differences occurred, the two scorers would consult until total agreement was achieved. As it happened, however, there were no disagreements between the two scorers. Thus, the procedure proved to be highly reliable in its scoring.

The rules for determining the generalization-specification scores from the cognitive maps were as follows:

1. Listen to tape and record on the cognitive maps all information that the student left off. This information should follow the logical sequence of the First Strategy of the Taba Model. The student teacher should ask a question which generates facts from the pupils about the concept. These facts are recorded under "Possible List" on the cognitive map. Then the student teacher asks what items from that list go together (steps 2 and 3) and those items are placed under "Possible Groups and Labels." Labels are given to those groups. The fourth step the student teacher asks is if there are any new items that go under "Items Under Labels" or "Labels Under Labels." Step five is listing any new groups and labels and they go under "New Groups and Labels."

2. Scoring the cognitive maps

   a. All the items in step one, Possible List, were counted. Any item listed once was accepted; items which may not have been particularly related were nevertheless accepted. Each of these items was given one point. (See Appendix J for an example of a scored cognitive map.) This total number was represented by N_e in the Generalization-Specification formula.

   b. All items in step two in labeled group were counted and given one point. Duplicates were not counted. N_g is the symbol for this number from the Generalization-Specification Scale.

   c. The number of items in the labeled groups N_l, step two, and items added to labeled groups, steps three and four, were counted each having one point, and any duplicates were not counted. Any items that are newly added in steps four and five were counted as one point each N_a. Any duplicates were not counted.

   d. The number of new groups and new labels were given one point each N_r. Any duplicates were not counted.

   e. Each tape was listened to for recording the exact time in minutes the recording took place. This information gave the data for t in the scale.

Data Analysis

For hypotheses 1-5, a one-way analysis of variance was run on the pre test mean scores to analyze differences. Since there were no major differences, the assumption was made that the three groups were similar to start with and the method of random assignment of student teachers to the three groups was considered acceptable. Therefore, an analysis of co-variance procedure was not necessary. The analysis of co-variance procedure would also have been less useful because of a sampling difficulty in EE groups. There were only a total of fourteen paired scores for pre and post measures compared to twenty-two paired scores in EEPT and twenty in Control. The loss of scores in EE was due to problems during the pre-taping. The tape quality was very poor and five tapes could not be used.

A one-way analysis of variance of post-test scores was run. When there was a significant value at (.05) level, a post hoc comparison of individual means using standard t-tests was used to determine where the differences were.

An individual t-test comparison was used to determine if any changes occurred from pre to post in any of the three groups.

For hypothesis 6, a one-way analysis of variance was run on the post scores to determine the differences in the scores of the two groups.

Additional Data Analysis

Two other areas were analyzed that were not stated in the hypotheses.

1. Hypothesis 1 investigated mean percent of student talk. In order to make some comparisons, it was felt that the researcher should investigate mean percent of teacher talk. With the results from the FIAS-22 matrices, the formula could be computed by:

$$\frac{10+21+22+31+32+33+34+41+42+51+52+53+61+62+63+70}{\text{Total Number of Tallies}}$$

2. Hypothesis 4 investigated mean percent time of teacher asking. The researcher felt that it would be beneficial to investigate the type of questioning behavior that was

exhibited. In the FIAS-22, code 41 dealt with factual questions asked by the teacher and 42 dealt with opinion questions asked by the teacher. In the mini course the student teachers were taught to ask factual questions. The percentage of factual questions asked by the teachers was calculated by the following formula:

$$\frac{41}{41 + 42}$$

The statistical analysis on these two areas was exactly the same as for hypotheses 1-5.

Instrumentation

FIAS-22

The FIAS-22 (Appendix C) was used to analyze the cassette tapes of the verbal interaction of the student teacher and pupils. The FIAS-22, as suggested by its label, is an expansion of the FIAS-10 (Appendix K), as mentioned in Chapter II. It is divided into twenty-two categories. The teachers' verbal behavior is classified as either indirect or direct, reflecting the amount of freedom the teacher grants to the students. Indirect teacher talk consists of nine observation categories: 10, 21, 22, 31, 32, 33, 34, 41, 42. Direct teacher influence consists of seven observation categories: 51, 52, 53, 61, 62, 63, 70. Student talk is divided into the student responding to the teacher 81, 82, and student initiating talk 91, 92. The final two categories deal with non-constructive use of time 01, and constructive use of time 02. (See FIAS-22, Appendix C.)

In order to analyze all the tallies, a matrix of the tallies that were recorded was formulated for each tape analyzed. This was done by computer programming. The matrix 22 x 22 consisted of four hundred eighty-four cells (See Appendix L). Each cell held the number of tallies reported. To get the total number of tallies for each code, the column for that code was totaled (Flanders, 1970). The results of the matrix provided specific information for the testing of hypotheses 1-5.

For scores and to test hypothesis 1, the percentage of pupil talk time was calculated by:

$$\frac{81 + 82 + 91 + 92}{\text{Total number of tallies}}$$

Slade (1975, p. 50) states that this percentage reflects certain parameters of the verbal interaction pattern. Normally a lower percentage of pupil talk, which tends to indicate more teacher talk, creates an atmosphere in which the pupil has less opportunity to participate and to respond with his/her own ideas (Slade, 1971).

The Institute for Staff Development (1971, p. xii), which has extensive experience in implementing the Taba Strategies, recommends pupil talk 50 percent of the discussion time. This is a performance objective for the Concept Development strategies that is used for training in-service teachers.

For testing hypothesis 2, the ratio of teacher responses that were indirect was computed in the following manner:

$$\frac{10+21+22+31+32+33+34+41+42}{51+52+53+61+62+63+70}$$

> "The I/D ratio "Indirect to direct," reflects certain dimensions of the verbal interaction pattern in the classroom. The style of verbal interaction pattern is usually influenced by how much freedom the teacher is willing to give the student to influence the scope and direction of their learning. Lower I/D ratios usually indicate more direct teacher statements thus limiting the freedom of students to direct their learning activities. Higher I/D ratios indicate less influence of the teacher on the learning activities of the student." (Slade, 1975, p. 63)

The Taba philosophy looks upon accepting as a necessary behavior for teachers when using the strategies in the First Strategy of the Taba Model. For testing hypothesis 3, the percentage of accepting teacher behavior was computed by:

$$\frac{10+21+22+31+32+33+34}{10+21+22+31+32+33+34+41+42+51+52+53+61+62+63+70}$$

In Concept Development, the First Strategy of the Taba Model, two types of teaching questions are considered necessary of those calling for facts (41) and opinion (42). For testing hypothesis 4 then, the percentage of asking teacher responses was computed by:

$$\frac{41,\ 42}{10+21+22+31+32+33+34+41+42+51+52+53+61+62+63+70}$$

The Taba philosophy would recommend frequency of pupil asking behavior as giving support to the inductive method of teaching. For testing hypothesis 5 then, the percentage of student asking was computed by:

$$\frac{82,\ 92}{81+82+91+92}$$

For the two additional analyses, the FIAS-22 was used as explained in Additional Data Analysis above.

Generalization-Specification Scale

This instrument was a measure designed exclusively for this study and has not been validated. It was an attempt to discriminate the level of generalization-specification of content verbal material generated by the pupil's learning through the steps of the First Strategy of the Taba Model. This measure analyzed the "cognitive map" which was a form that the student teacher filled out after the last taping session recording the content of the verbal information generated by the pupils.

The instrument cannot be justifiably applied to the pre-tapes because it was based on the nature of the First Strategy of the Taba Model which was not used by the student teachers at the pre-tape time. The formula was designed by Dr. Don Martin, Syracuse University, Syracuse, New York.

This Generalization-Specification formula is:

$$\text{Score: } \frac{Ne + 2\,Ng + 3(N_1 + Na) + 4Nr}{T}$$

Where: Ne = number items enumerated by the students and listed on the cognitive map under possible list

Ng = number items grouped in step two on the cognitive map under possible groups and labels

N_1 = number items in labeled groups in steps two and three on the cognitive map under possible groups and labels

Na = number items added to labeled groups Step 4 - any new items

Nr = number items in refined groups - Step 5 any new items

T = time of exercise in minutes that teacher records

The rationale for the formula was that the succeeding steps of the First Strategy of the Taba Model have increasing value with respect to concept formation. The more information and relationships the students see as they progress through the steps, the more weighting the formula gives. It is felt that it is more difficult to attain step 5 on the cognitive map, and thus it should get more points. The weighting of the categories was arbitrary and the validation of this formula awaits extensive trial.

For hypothesis 6, the Generalization-Specification mean scores of the two treatment groups were analyzed for this hypothesis. The Generalization-Specification formula was used.

Adapted Instructional Rating Survey

An Adapted Instructional Rating Survey (Appendix M) was given to the two treatment groups at the end of the post-taping for the purpose of determining if the two group perceptions of the instructor's teaching was similar.

The Instructional Rating Survey (Appendix N) was designed by George G. Stern and Joel Richman. It is presently used for instructional evaluation at Syracuse University. The researcher adapted the survey to meet her needs, eliminating questions 13, 22-30, 34-44, and rewording item 19.

For each question on the Adapted Instructional Rating Survey, there was a five point rating scale: 1 = exceptional/outstanding; 2 = above average; 3 = average; 4 = below average/just average; 5 = unsatisfactory.

The questions dealt with how the student teacher rated the researcher: willingness to hear ideas from students, patience, warmth, availability to meet with students, personal interest in the class, enjoyment of teaching, ability to involve students in the course material, willingness to help students who were having difficulty, ability to help students learn the material, concern for student progress, knowledge of course material, quality of preparation for class period, ability to provoke thought and stimulate critical thinking, average of overall course content, intellectual challenge, effectiveness of the course to provide new view points, increase in understanding of the subject matter due to the course, overall method, class discussions, and outside work.

It was expected that the two treatment groups would rate the instructor the same in all categories except class discussion as the Explaining and Peer Teaching group got the two-hour session of practice and discussion. Item 19 (See Appendix N) of the Adapted Instructional Rating Survey is the class discussion.

There were three open ended questions at the end of the survey that the researcher used to gather more information from the students. Those questions dealt with the student teacher's perception of what gave them the most trouble at pre- and post-tape times: discipline, the concept, both, neither. The last question dealt with where the student teacher learned to lead a group discussion: the project, other professors, ~~did~~ it naturally, previous experiences in the campus school, other.

The researcher formulated these questions as the result of two things. During the taping times, both pre and post, the students complained of discipline problems. The researcher was interested in documenting how many students and from which groups the students' perceptions were concerned with discipline.

The other question occurred because the researcher sensed that the students were of a more accepting nature than she originally perceived they would be. The techniques in leading a good group discussion require accepting behavior. The researcher was interested in identifying where the students learned how to lead a group discussion.

CHAPTER IV

THE RESULTS

The purpose of this experimental study was to assess the relative effectiveness of two methods of instruction for developing student teachers' skills in teaching pupils using the First Strategy of the Taba Model.

This chapter reports the results in relation to the six hypotheses presented in the Questions, Hypotheses, and Additional Statistical Analysis. This chapter is divided into four sections. The first deals with Hypotheses 1-5 which used the FIAS-22 for the analysis instrument; the second section, Hypothesis 6, deals with the table of Generalization-Specification; the third section deals with the instructor rating survey and some of the evaluations and perceptions that the students identified as they relate to the study; and the fourth deals with the results of the additional statistical analysis.

For the purposes of this study the .05 level was used for the t-test and F-test as the measure of significance. The t-test .05 at 30 degrees of freedom equals 2.042. For the F-test (.05) with 2,60 degrees of freedom equals 3.1504.

Two major questions were asked upon which the Hypotheses 1-6 were devloped. First, what is the effect of an instructional method based on Explaining?; second, what is the effect of an instructional method which combined Peer Teaching with Explaining? In order to answer the question, six Hypotheses were stated in the null form.

Table 1_a is a summary table of the means for the three groups at pre and post times, 1_b is a summary of the Instructional Rating Survey and 1_c is a summary of Additional Statistical results.

Hypotheses $1_{a,b,c,d}$ - Percentage of Pupil Talk

H_{1a} There will be no significant differences among the three groups in mean percentage of pupil talk as measured by the FIAS-22 on the post-test.

The results of the test for this hypothesis are given in Table 2. The results indicate that hypothesis 1_a cannot be rejected. The conclusion then is that there were no significant differences detected among the three groups in the post-test.

H_{1b} There will be no significant differences between pre and post tests in mean percentage of pupil talk time as measured by the FIAS-22 in the Explaining group.

The results of the test for this hypothesis are given in Table 2. The results indicate that hypothesis 1_b cannot be rejected. The conclusion then is that there were no significant differences detected between the pre-post tests for the Explaining group.

H_{1c} There will be no significant differences between pre and post tests in mean percentage of pupil talk time as measured by the FIAS-22 in the Explaining and Peer Teaching group.

The results of the test for this hypothesis are given in Table 2. The results indicate that hypothesis 1_c cannot be rejected.

TABLE 1_a

Summary of Means for Hypotheses 1-6

Hypothesis		Explaining	Explaining and Peer Teaching	Control	Significant F Among Treatment Means
H_1 Percent Pupil talk time	Pre	.5022	.4410	.4645	
	Post	.4454	.4284	.4763	
	Sig. Post minus Pre t's				
	The results were computed from the FIAS-22 categories $\frac{81+82+91+92}{\text{Total number of tallies}}$				
H_2 Indirect to direct teacher talk ratio	Pre	2.9808	2.1620	2.1448	
	Post	2.7849	2.6442	4.0331	
	Sig. Post minus Pre t's				
	The results were computed from the FIAS-22 categories $\frac{10+21+22+31+32+33+34+41+42}{51+52+53+61+62+63+70}$				
H_3 Percent of teacher accepting responses	Pre	.2136	.1950	.1819	
	Post	.2606	.3151	.2037	*
	Sig. Post minus Pre t's		*		
	The results were computed from the FIAS-22 categories $\frac{10+21+22+31+32+33+34}{10+21+22+31+32+33+34+41+42+51+52+53+61+62+63+70}$				
H_4 Percent of teacher asking responses	Pre	.4207	.4424	.4338	
	Post	.4226	.3748	.4766	
	Sig. Post minus Pre t's		*		
	The results were computed from the FIAS-22 categories $\frac{41, 42}{10+21+22+31+32+33+34+41+42+51+52+53+61+62+63+70}$				

Hypothesis		Explaining	Explaining and Peer Teaching	Control	Significant F Among Treatment Means
H_5 Percent of pupil asking responses	Pre	.0308	.0366	.0335	
	Post	.0327	.0340	.0313	
	Sig. Post minus Pre t's				
	Results were computed from the FIAS-22 categories $\frac{82,\ 92}{81+82+91+92}$				
H_6 Means from Generalization-Specification Scale	Post	11.1199	12.1702		
	Sig. Post minus Pre t's				
	Results were computed from the means of the Generalization-Specification Scale.				

*Significant at the (.05) level

TABLE 1_b

Summary of Adapted Instruction Rating Survey for Means and t-tests

The students were to choose an alternative from the following list that best described the instructor.

1. Exceptional/Outstanding
2. Above Average
3. Average
4. Below Average/Just Adequate
5. Unsatisfactory

	Means		
	EE Explaining	EEPT Explaining and Peer Teaching	Sig. t's
1. Instructor's willingness to hear ideas from students	1.8421	1.6667	
2. Instructor's patience	1.6316	1.7500	
3. Instructor's warmth	1.9474	2.0833	
4. Instructor's availability to meet with students	1.6842	1.9583	
5. Instructor's personal interest in the class	1.6842	1.7917	
6. Instructor's enjoyment of teaching	1.7368	2.0000	
7. Instructor's ability to involve students in the course	2.1579	1.8750	
8. Instructor's willingness to help students who are having difficulty	1.6316	1.7917	
9. Instructor's ability to help students learn the material	1.8947	1.9583	
10. Instructor's concern for student progress	1.6842	1.9583	
11. Instructor's knowledge of the course material	1.5789	1.9583	
12. Quality of the instructor's preparation for class periods	1.9474	2.0000	
13. Instructor's ability to provoke thought and stimulate critical thinking	2.3158	2.2917	
14. Instructor's coverage of overall course content	2.3158	2.4783	
15. Intellectual challenge provided by the course	2.5263	2.6250	
16. Effectiveness of the course in providing new viewpoints	2.3684	2.2083	
17. Increase in understanding of the subject matter due to the course	2.3684	2.1250	
18. Rating of overall method	2.5263	2.3750	
19. Rating of class discussions	3.1053	2.5417	2.23*
20. Rating of paper and/or outside work as learning experiences	2.2632	2.2083	

*Significant at .05 level

TABLE 1_c

Summary for Additional Statistical Analysis

		Explaining	Explaining & Peer Teaching	Control	Significant F Among Treatment Means
Percentage of Teacher Talk	Pre	.3497	.3906	.3418	
	Post	.3618	.3774	.3682	
	Sig. Post minus Pre t's				
	Results computed from the FIAS-22 categories $\frac{10, 21, 22, 31, 32+33+34+41+42+51+52+53+61+62+63+70}{\text{Total number of tallies}}$				
Percentage of Teacher Asking Factual Questions	Pre	.4319	.5131	.5939	
	Post	.6640	.7102	.4930	*
	Sig. Post minus Pre t's	*	*		
	Results computed from the FIAS-22 categories $\frac{41}{41+42}$				

* Sig. at .05 level

TABLE 2

One-Way Analysis of Variance
for Hypothesis $1_{a,b,c,d}$

Percent of Means and Standard Deviations for Pupil Talk Time Using FIAS-22

Group	Pre-tape	Post-tape	Total	Significant Post minus Pre t's
EE (Explaining)				
N	16	19	.35	
Avg.	.5022	.4454	.4713	
S.D.	.1034	.0598	.0862	
EEPT (Explaing and Peer Teaching)				
N	24	22	46	
Avg.	.4410	.4284	.4333	
S.D.	.0979	.0665	.0838	
Control				
N	20	21	41	
Avg.	.4645	.4763	.4705	
S.D.	.0902	.1018	.0953	
Total				
N	60	62	122	
Avg.	.4651	.4486	.4567	
S.D.	.0984	.0803	.0896	
F	1.9133	2.3208		
t EE-EEPT				
EE-C				
EEPT-C				

Summary of Above

Pre Source	SS	df	MS	F
Treatments	.0360	2	.0180	1.9133
Errors	.5357	57	.0094	
Total	.5717			

Post Source	SS	df	MS	F
Treatments	.0287	2	.0143	2.3208
Errors	.3646	59	.0062	
Total	.3933			

*(.05) F(2,60) = 3.1504
(.05) t (30) = 2.042

The conclusion then is that there were no significant differences detected between the pre-post tests for the Explaining and Peer Teaching group.

H_{1d} There will be no significant differences between pre and post tests in mean percentage of pupil talk time as measured by the FIAS-22 in the Control group.

The results of the test for this hypothesis are given in Table 2. The results indicate that hypothesis 1_d cannot be rejected. The conclusion then is that there were no significant differences detected between the pre-post tests for the Control group.

Hypotheses $2_{a,b,c,d}$ - Ratio of Indirect to Direct Teacher Responses

H_{2a} There will be no significant differences among the three groups in mean ratio of teacher responses that are indirect compared to direct as measured by the FIAS-22 on the post-test.

The results of the test for this hypothesis are given in Table 3. The results indicate that hypothesis 2_a cannot be rejected. The conclusion then is that there were no significant differences detected among the three groups on the post-test.

H_{2b} There will be no significant differences between the pre and post tests in mean ratio of teacher responses that are indirect compared to direct as measured by the FIAS-22 for the Explaining group.

The results of the test for this hypothesis are given in Table 3. The results indicate that hypothesis 2_b cannot be rejected.

TABLE 3

One-Way Analysis of Variance for Hypothesis $2_{a,b,c,d}$

Ratio of Teacher Responses that are Indirect Compared to Direct

Group	Pre-tape	Post-tape	Total	Significant Post minus Pre t's
EE (Explaining)				
N	16	19	35	
Avg.	2.9808	2.7849	2.8744	
S.D.	2.9667	1.9322	2.4227	
EEPT (Explaining and Peer Teaching)				
N	24	22	46	
Avg.	2.1620	2.6441	2.3925	
S.D.	1.3731	1.5973	1.4878	
Control				
N	20	20	40	
Avg.	2.1448	4.0332	3.0890	
S.D.	1.6183	4.7937	3.6586	
Total				
N	60	61	121	
Avg.	2.3746	3.1434	2.7622	
S.D.	1.9879	3.1122	2.6334	
F	1.0154	1.2361		
t EE-EEPT				
EE-C				
EEPT-C				

Summary of Above

Pre Source	SS	df	MS	F
Treatments	8.0210	2	4.0105	1.0154
Errors	225.1425	57	3.9499	
Total	233.1636			

Post Source	SS	df	MS	F
Treatments	23.7578	2	11.8789	1.2361
Errors	555.3951	58	9.6102	
Totals	581.1529			

*(.05) F (2,60) = 3.1504

(.05) t (30) = 2.042

The conclusion then is that there were no significant differences detected between the pre-post tests for the Explaining group.

H_{2c} There will be no significant differences between the pre and post tests in mean ratio of teacher responses that are indirect compared to direct as measured by the FIAS-22 for the Explaining and Explaining and Peer Teaching group.

The results of the test for this hypothesis are given in Table 3. The results indicate that hypothesis 2_c cannot be rejected. The conclusion then is that there were no significant differences detected between the pre-post tests for the Explaining and Peer Teaching group.

H_{2d} There will be no significant differences between pre and post tests in ratio of teacher responses that are indirect compared to direct as measured by the FIAS-22 in the Control group.

The results of the test for this hypothesis are given in Table 3. The results indicate that hypothesis 2_d cannot be rejected. The conclusion then is that there were no significant differences detected between the pre-post tests for the Control group.

Hypotheses $3_{a,b,c,d}$ - Percentage of Teacher Accepting Responses

H_{3a} There will be no significant differences among the three groups in mean percentage of number of responses by teachers that are accepting, as measured by FIAS-22 on the post-test.

The results of the test for this hypothesis are given in Table 4. The one-way analysis of variance of the post-test scores

TABLE 4

One-Way Analysis of Variance
for Hypotheses $3_{a,b,c,d}$

Percent of Means and Standard Deviations of Teacher Accepting Responses Using FIAS-22

Group	Pre-tape	Post-tape	Total	Significant Post minus Pre t's
EE (Explaining)				
N	16	19	35	
Avg.	.2136	.2606	.2391	
S.D.	.0924	.0792	.0875	
EEPT (Explaining and Peer Teaching)				
N	24	22	46	
Avg.	.1950	.3151	.2524	5.4130*
S.D.	.0789	.0710	.0960	
Control				
N	20	21	41	
Avg.	.1819	.2037	.1931	
S.D.	.0789	.1040	.0921	
Total				
N	60	62	122	
Avg.	.1956	.2606	.2287	
S.D.	.0822	.0965	.0952	
F	.6545	9.0415*		
t EE-EEPT		-2.0269		
EE-C		2.0933*		
EEPT-C		4.2536*		

Summary of Above

Pre Source	SS	df	MS	F
Treatments	.0089	2	.0045	.6546
Errors	.3893	57	.0068	
Total	.3982			

Post Source	SS	df	MS	F
Treatments	.3335	2	.0667	9.0415*
Errors	.4351	59	.0074	
Total	.5684			

*(.05) F (2,60) = 3.1504
(.05) t (30) = 2.042

produced an F value of 9.0415 which is significant at the .05 level. Also there were significant differences between each of the groups. Individual comparisons using the t-test determined that the Explaining group was significantly greater than the Control at the 2.0933 level; the Explaining and Peer Teaching group was significantly greater than the Control at the 4.2536 level; the Explaining group approached the significant level with a -2.0269 in being different from the Explaining and Peer Teaching group. The conclusion then is that the Explaining and Explaining and Peer Teaching groups are significantly different from the Control. Therefore, this hypothesis can be rejected.

H_{3b} There will be no significant differences between the pre and post tests in mean percentage of number of responses by teachers that are accepting as measured by the FIAS-22 for the Explaining group.

The results of the test for this hypothesis are given in Table 4. The results indicate that hypothesis 3_b cannot be rejected. The conclusion then is that there were no significant differences detected between the pre-post tests for the Explaining group.

H_{3c} There will be no significant differences between the pre and post tests in mean percentage of number of responses by teachers that are accepting as measured by the FIAS-22 for the Explaining and Peer Teaching group.

The results of the test for this hypothesis are given in Table 4. The one-way analysis of variance of the pre-post test scores produced an F value of 5.4130 which is significant at the .05 level. The Explaining and Peer Teaching group significantly changed from pre to post in their accepting behavior. The conclusion then is that the Explaining and Peer Teaching group significantly changed from pre to post, therefore, this hypothesis can be rejected.

H_{3d} There will be no significant differences between the pre and post tests in mean percentage of number of responses by teachers that are accepting as measured by the FIAS-22 for the Control group.

The results of the test for this hypothesis are given in Table 4. The results indicate that hypothesis 3_d cannot be rejected. The conclusion then is that there were no significant differences detected between the pre-post tests for the Control group.

Hypotheses $4_{a,b,c,d}$ - Percentage of Teacher Asking Responses

H_{4a} There will be no significant differences among the three groups in mean percentage of teacher responses that are asking, as measured by FIAS-22 on the post-test.

The results of the test for this hypothesis are given in Table 5. The results indicate that hypothesis 4_a cannot be rejected. The conclusion then is that there were no significant differences detected among the three groups on the post-test.

TABLE 5

One-Way Analysis of Variance for Hypothesis $4_{a,b,c,d}$

Percent of Means and Standard Deviations for Teacher Responses that were asking on FIAS-22

Group	Pre-tape	Post-tape	Total	Significant Post minus Pre t's
EE (Explaining)				
N	16	19	35	
Avg.	.4206	.4226	.4217	
S.D.	.1812	.1485	.1619	
EEPT (Explaining and Peer Teaching)				
N	24	22	46	
Avg.	.4424	.3748	.4101	-2.0914*
S.D.	.1221	.0940	.1136	
Control				
N	20	21	41	
Avg.	.4338	.4766	.4555	
S.D.	.1488	.1837	.1669	
Total				
N	60	62	122	
Avg.	.4337	.4238	.4287	
S.D.	.1462	.1497	.1475	
F	.1019	2.5967		
t EE-EEPT				
EE-C				
EEPT-C				

Summary of Above

Pre Source	SS	df	MS	F
Treatments	.0045	2	.0022	.1019
Errors	1.2574	57	.0220	
Total	1.2619			

Post Source	SS	df	MS	F
Treatments	.1107	2	.0553	2.5967
Errors	1.2572	59	.0213	
Total	1.3679			

*(.05) F (2,60) = 3.1504
(.05) t (30) = 2.042

H_{4b} There will be no significant differences between the pre and post tests in mean percentage of teacher responses that are asking as measured by the FIAS-22 for the Explaining group.

The results of the test for this hypothesis are given in Table 5. The results indicate that hypothesis 4_b cannot be rejected. The conclusion then is that there were no significant differences detected between the pre-post tests for the Explaining group.

H_{4c} There will be no significant differences between the pre and post test in mean percentage of teacher responses that are asking as measured by the FIAS-22 for the Explaining and Peer Teaching group.

The results of the test for this hypothesis were given in Table 5. A t-test was run on the pre-post mean scores which produced a t value of -2.0914 which is significant at the .05 level. The conclusion then is that the Explaining and Peer Teaching group asked significantly fewer questions at post-tape time. The results indicate that hypothesis 4_c can be rejected.

H_{4d} There will be no significant differences between the pre and post test in mean percentage of teacher responses that are asking as measured by the FIAS-22 for the Control group.

The results of the test for hypothesis 4_d were given in Table 5. The results indicate that hypothesis 4_d cannot be rejected. The conclusion then is that there were no significant differences detected between the pre-post tests for the Control group.

TABLE 6

One-Way Analysis of Variance
for Hypothesis $5_{a,b,c,d}$

Percent of Means and Standard Deviations for Pupil Responses that are Asking Using FIAS-22

Group	Pre-tape	Post-Tape	Total	Significant Post minus Pre t's
EE (Explaining)				
N	16	19	35	
Avg.	.0308	.0327	.0318	
S.D.	.0308	.0213	.0257	
EEPT (Explaining and Peer Teaching)				
N	24	22	41	
Avg.	.0366	.0340	.0339	
S.D.	.0328	.0159	.0260	
Control				
N	20	21	41	
Avg.	.0335	.0313	.0323	
S.D.	.0276	.0278	.0273	
Total				
N	60	62	122	
Avg.	.0340	.0316	.0328	
S.D.	.0302	.0218	.0261	
F	.1751	.0346		
t EE-EEPT				
EE-C				
EEPT-C				

Summary of Above

Pre Source	SS	df	MS	F
Treatments	.0003	2	.0001	.1751
Errors	.0534	57	.0009	
Total	.0538			

Post Source	SS	df	MS	F
Treatments	.00004	2	.00002	.0346
Errors	.0289	59	.0005	
Total	.0290			

*(.05) F(2,60) = 3.1504
(.05) t (30) = 2.042

Hypotheses $5_{a,b,c,d}$ - Percentage of Pupil Asking Responses

H_{5a} There will be no significant differences among the three groups in mean percentage of pupil responses that are asking as measured by FIAS-22 on the post-test.

The results of the test for this hypothesis were given in Table 6. The results indicate that hypothesis 5_a cannot be rejected. The conclusion then is that there were no significant differences detected among the three groups in post tests.

H_{5b} There will be no significant differences between the pre and post tests in mean percentage of pupil responses that are asking as measured by the FIAS-22 for the Explaining group.

The results of the test for this hypothesis were given in Table 6. The results indicate that hypothesis 5_b cannot be rejected. The conclusion then is that there were no significant differences detected between the pre-post tests for the Explaining group.

H_{5c} There will be no significant differences between the pre and post tests in mean percentage of pupil responses that are asking as measured by the FIAS-22 for the Explaining and Peer Teaching groups.

The results of the test for this hypothesis were given in Table 6. The results indicate that hypothesis 5_c cannot be rejected. The conclusion then is that there were no significant differences detected between the pre-post tests for the Explaining and Peer Teaching group.

H_{5d} There will be no significant differences between the pre and post tests in mean percentage of pupil responses that are asking as measured by the FIAS-22 for the Control group.

The results of the test for this hypothesis were given in Table 6. The results indicate that hypothesis 5_d cannot be rejected. The conclusion then is that there were no significant differences detected between the pre-post tests for the Control group.

Hypothesis 6 - Generalization-Specification Scale

H_6 There were no significant differences among the two groups, EE and EEPT, in mean Generalization-Specification Scale score.

The results of the tests for this hypothesis are given in Table 7. The results indicate that hypothesis 6 cannot be rejected. Conclusion is then that EE and EEPT are not different with respect to the table of Generalization-Specification.

Adapted Instructional Rating Survey

The Adapted Instructional Rating Survey which was discussed in Chapter III was used to determine if the perceptions of the instructor as shown by the student teachers in the two treatment groups were similar. According to Tables 1-20 (Appendix O), there were no significant differences between the two groups except on item 19. In item 19 the student teacher was to rate the class discussions on a 5 point scale. Item 19 had a t value of 2.23 which is significant at the .05 level. The EEPT gave the instructor a higher rating of class discussion than the EE group.

Three other questions were asked in the survey. Two dealt with pre- and post-tapings. The students were asked to identify what they had the most difficulty with at pre- and post-taping times. Their choices were discipline, concept, both, neither. Unfortunately only twelve students of group C, eighteen of Explaining and twenty-four of Explaining and Peer Teaching answered the survey. The reason for the low reporting of group C was due to poor weather conditions and some of the students were unable to attend the last class. Summary of their reports are in Appendix $P_{1a,\ 1b,\ 1c}$. Of the total number who answered the questions, only thirteen reported a problem with the concept at pre-taping compared to six reporting a problem at post-taping. Twenty-one students reported a problem with discipline at pre-tape time and thirty-two at post-tape time.

The third question dealt with asking the students - where did you learn how to lead a group discussion: previous experience in the campus school, my professor other than in the study, did it naturally, from the Project, other? Unfortunately, of the total number of students that answered (54), ten made more than one choice. The results (See Appendix P_{1d}) are for the three groups. Twelve felt they learned to lead a group discussion and develop a concept from previous experience in the campus school; five - my professors other than in the study; ten did it naturally; thirty-five - from the Project; and three - other.

TABLE 7

One-Way Analysis of Variance
for Hypothesis 6

eans and Standard Deviations for Generalization-Specification Scale

Group	Post
EE (Explaining)	
N	19
Avg.	11.1199
S.D.	5.4060
EEPT (Explaining and Peer Teaching)	
N	24
Avg.	12.1702
S.D.	3.7583

Summary of Above

Source	SS	df	MS	F
Treatments	11.6986	1	11.6986	.5637
Errors	850.9435	41	20.7547	
Total	862.6420			

Range of score for	
EE	(4 - 25)
EEPT	(4 - 21)

Additional Statistical Analysis

Two other areas were examined in depth using the same procedure as in hypotheses 1-5. A one-way analysis of variance was run on the pre-post test scores for the three groups. A t-test was run on pre-post means for each individual group.

The two areas examined were mean percentage of teacher talk using the FIAS-22, and mean percentage of teacher questions that were of a factual nature. The results are as follows:

1. Teacher talk

Results of statistical analysis for teacher talk are recorded in Table 8. There were no significant differences in all tests run. The conclusion then is that there appears to be no differences in percentage of teacher talk among groups, and within groups for pre to post tests.

2. Percentage of teacher questions that were factual

The results for teacher questions that were factual is recorded in Table 9. Results indicate that there was significant differences on the post tests and between the pre and post tests. They are as follows: The one-way analysis of variance of the post-test scores produced an F value of 4.4352 which is significant at the .05 level. Individual comparisons using the t-test determined that the Explaining group was significantly greater than the Control group at 2.8488 level, and the Explaining and Peer Teaching group was significantly greater than the Control at 2.1611 level. Pre-post t-tests were run for the three groups. A significant difference was noted for the Explaining Group. A 2.6070 level of significance was reported. Also, there was significance for the Explaining and

TABLE 8

One-Way Analysis of Variance
for
Percentage of Means and Standard Deviations of Teacher Talk Using FIAS-22

Group	Pre-tape	Post-tape	Total	Significant Post minus Pre t's
EE (Explaining)				
N	16	19	35	
Avg.	.3497	.3618	.3563	
S.D.	.1369	.0926	.1134	
EEPT (Explaining and Peer Teaching)				
N	24	22	46	
Avg.	.3906	.3774	.3843	
S.D.	.1174	.1103	.1130	
Control				
N	20	21	41	
Avg.	.3418	.3682	.3553	
S.D.	.1087	.1200	.1140	
Total				
N	60	62	122	
Avg.	.3634	.3695	.3665	
S.D.	.1203	.1072	.1134	
F	1.0411	.1069		
t EE-EEPT				
EE-C				
EEPT-C				

Summary of Above

Pre

Source	SS	df	MS	F
Treatments	.0301	2	.0150	1.0411
Errors	.8232	57	.0144	
Total	.8532			

Post

Source	SS	df	MS	F
Treatments	.0025	2	.0013	1.0692
Errors	.6980	59	.0118	
Total	.7005			

*(.05) F (2,60) = 3.1504
(.05) t (30) = 2.042

TABLE 9

One-Way Analysis of Variance for Percentage of Means and Standard Deviations for Teacher Questions that were Factual Using FIAS-22

Group	Pre-tape	Post-tape	Total	Significant Post minus Pre t's
EE (Explaining)				
N	16	19	35	
Avg.	.4319	.6640	.5579	2.6070*
S.D.	.3075	.2177	.2838	
EEPT (Explaining and Peer Teaching)				
N	24	22	46	
Avg.	.5131	.7102	.6074	2.9796*
S.D.	.2509	.1905	.2430	
Control	20	21	41	
N	.5939	.4930	.5422	
Avg.	.2968	.3219	.3103	
S.D.				
Total				
N	60	62	122	
Avg.	.5140	.6225	.5713	
S.D.	.2845	.2637	.2770	
F	1.4710	4.4352*		
t EE-EEPT				
EE-C		2.1611*		
EEPT-C		2.8488*		

Summary of Above

Pre Source	SS	df	MS	F
Treatments	.2344	2	.1172	1.4710
Errors	4.5408	57	.0797	
Total	4.7751			
Post Source				
Treatments	.5544	2	.2772	4.4352*
Errors	3.6876	59	.0625	
Total	4.2420			

*(.05) F (2,60) = 3.1504

(.05) t (30) = 2.042

Peer Teaching group at the 2.9796 level.

The conclusion then is that the Explaining group asked significantly more factual questions than the Control group, and also asked significantly more factual questions at post-tape time. Explaining and Peer Teaching also asked significantly more factual questions than the Control, and also like the Explaining group, asked significantly more factual questions at post-tape time. Explaining and Explaining and Peer Teaching were not significantly different from each other, but EEPT did ask more factual questions.

A table was set up to show the variables that the rater when scoring the FIAS-22 noted during her observations (See Appendix Q). She observed a total of fifteen control problems at pre-tape time and ten at post-tape time for all three groups. For lack of teacher direction a total of five at pre- and two at post-tape time; for poor tape quality - thirteen at pre and three at post; and second taping - three at pre and none at post-taping time.

Summary

The results of the statistical analysis allowed for rejecting hypotheses 3_a, 3_c and 4_c. The rest of the eighteen hypotheses could not be rejected.

The Instructional Rating Survey analysis showed significant difference on item 19, class discussion. Information for the three other survey questions was reported. The Additional Data Analysis showed significant differences for the teacher questions that were factual, and information regarding the rater's observations of other variables during the taping was summarized.

This summary will be expanded in Chapter V.

CHAPTER V

SUMMARY OF RESULTS, LIMITATIONS, INTERPRETATION AND FURTHER RECOMMENDATIONS

Overview

In this experimental process-product study, an attempt was made to examine the apparent effect of two different methods of instruction (Explaining, and Explaining and Peer Teaching) of student teachers in the acquisition of some specific teaching behaviors, First Strategy of the Taba Model. The criterion measure was the student teachers' performance with elementary pupils. Sixty-six student teachers and 200 (7-11 year olds) elementary pupils from SUNY at Oswego, Oswego, N.Y. were involved.

The evaluation instruments employed in this study were Flanders Interaction Analysis System-22, Generalization-Specification Scale, and the Adapted Instructional Rating Survey.

The data were collected on audio tapes for the FIAS-22. A trained rater rated the tapes using the FIAS-22. A matrix for the FIAS-22 was generated to answer hypotheses 1-5.

Another rater was trained to score the cognitive maps with the Generalization-Specification Scale. The Generalization-Specification Scale was the measure used on hypothesis 6.

An Adapted Instructional Rating Survey was used to analyze how the two treatment groups rated the instructor.

Two post hoc procedures were done on the FIAS-22 analyzing percentage of teacher factual questions and percentage of teacher talk time.

Summary of Results

The comparisons of data generated by the one-way analysis of variance on post measures on the FIAS-22 showed significant differences at the .05 level for hypotheses 3_a. 3_c and 4_c. They are as follows stated in their null form. All the rest of the of the null hypotheses showed no differences.

H_{3a} There will be no significant differences among the three groups in mean percentage of number of responses by teachers that are accepting as measured by FIAS-22 on the post-test.

H_{3c} There will be no significant differences between the pre- and post-tests in mean percentage of number of responses by teachers that are accepting as measured by the FIAS-22 for the Explaining and Peer Teaching group.

H_{4c} There will be no significant differences between the pre- and post-tests in mean percentage of teacher responses that are asking as measured by the FIAS-22 for the Explaining and Peer Teaching group.

In hypothesis 3_a the Explaining and Peer Teaching group at post-tape time was significantly more accepting in their interaction with pupils than the control. The Explaining and Peer Teaching group approached the significance level in being more accepting in their interaction with pupils than the Explaining group. The Explaining group was significantly more accepting in their verbal interaction with pupils than the control.

Hypothesis 3_c, the Explaining and Peer Teaching group, became changed in their own verbal behavior between pre- and post-time and became significantly more accepting in their verbal interaction with pupils.

For hypothesis 4_c the Explaining and Peer Teaching group asked significantly fewer questions at post-tape time as compared to pre-tape time.

In the Instructional Rating Survey, rating of item nineteen "class discussion" showed a significant difference at the .05 level. The Explaining and Peer Teaching group rated the instructor higher than the Explaining group on that item.

Three additional questions were asked in the Instructional Rating Survey and answered by the three groups. It is important to remember here that only half of group C reported on their questions.

The first two dealt with problems with discipline and the concept taught at pre- and post-taping times. The EE group reported the most problems of discipline (7) at pre time compared to EEPT (4) and C (5); EEPT reported most problems at post (14) as compared to EE (11) and C (3).

The EEPT group reported more problems at pre-tape time with the concept (6) than EE (2) or C (0). EEPT and EE reported one problem each at post-taping. The control reported no problems at post-taping. Some students from the three groups reported that they had trouble with both discipline and the concept - five at pre and four at post-taping.

Interestingly, the students reported more problems at post-taping with discipline and less with the concept.

The third question dealt with - where did you learn how to lead a group discussion? It is important to remember here that of the fifty-four students who answered, ten made more than one choice. Over half of the responses were from the project, twelve felt they learned how to lead a group discussion from previous experience in the campus school, ten felt they did it naturally, five from other professors and three other.

Post hoc results of the additional statistical analysis showed significant results among the three groups on the FIAS-22 for teacher questions that were factual. Both the Explaining and Explaining and Peer Teaching groups asked significantly more factual questions than the control. Both the Explaining and Explaining and Peer Teaching groups asked significantly more factual questions at post-tape time than at pre-tape time.

The rater who scored the FIAS-22 noted that for all three groups there were fifteen control problems at pre-tape time and ten at post-tape; for lack of teacher direction-five at pre-tape and two at post; poor tape quality - thirteen at pre and three at post; and for second taping - three at pre and none at post.

Limitations

Due to the scope and complexity of the study, there are some specific limitations that the reader should consider when interpreting the results. Listed below are those limitations considered important to the interpretation of the reported results.

1. Statistical Procedure.

In treatment group EE, during the pre-tape data collection, four of the audio recorders were on batteries. Unbeknown to the researcher, when the electrical plug was plugged in, the batteries still acted as the source of power. By the time the researcher discovered that the batteries were weak and that the recordings were poor, it was too late to save the data. Thus, EE had only fourteen paired scores when compared to EEPT and the Control. The one-way analysis of variance allowed for the use of all the scores at pre and post times. Therefore, the reader should judge the scores based on the fact that some are not paired, EE having the least amount of total scores.

2. Non-independent Variables

Because of the nature of the tight internal controls of the study, an external problem that the researcher observed could not be controlled. During some of the taping time, the pupils acted up prior to taping and during some of the taping situations. The researcher did not step in and request that the pupils behave. There were a number of control problems that the rater noted when listening to the tapes. The variable of control was one that the researcher had envisioned as a possible obstacle. However, the researcher was primarily interested in actual teaching behavior before training and after.

Thus it was important to see if control was a problem and if it was, did it prevent teaching from occurring.

3. Generalizability of Study

   Since the population was at only one university, and the pupils used were at a campus school, a cross sample of population was not the case. Due to the fact that the inter-rater reliability was not established, the findings of this study cannot be generalized to other studies.

4. The pupils in the campus school who were used in this study had to be taught by the student teachers as many as four times. The frequency may have been the cause of some of the behavior problems which occurred when the student teachers taught them. No student teacher taught the same group of pupils at post-taping time. The newness of the student teacher to the group of children may have also been an influencing variable.

Interpretation

Percent of Talk Time for Student Teachers and Pupils (Teacher Indirect to Direct, Teacher Accepting Behavior)

The results on the FIAS-22 showed some interesting results which were unexpected. The first surprise was the percent of talking time by pupils and teacher at pre-tape time. In Stickel's (1972, p. 47) review of the literature, he summarized Joseph C. Bondi's statement.

Referring to Flanders' system, Bondi points out:

> Interaction analysis is concerned primarily with verbal behavior, which, although only one aspect of teaching behavior, is one of the most important, since most of the functions associated with classroom teaching are implemented by verbal communications. In both elementary and secondary classrooms, someone is talking more than 60 percent of the time, and more than 70 percent of the time it is the teacher....

Based on Bondi's statement, the researcher expected the student teachers at pre-tape time to talk about seventy percent of the time, the rationale being that the pre-service teacher might behave similarly to the in-service teacher or even talk more than the seventy percent of the time. Interestingly, the student teachers in all three groups at pre-tape time talked an average of thirty-six percent of the time. The pupils talked an average of forty-six percent of the time. The remaining time recorded, eighteen percent, was classified as constructive or-non constructive use of time. (See Appendix C, Code 01 and 02)

This information is particularly important for competency-based teacher education (CBTE) programs. Program developers should diagnose student teachers' skills before instruction and then set goals for student teachers to attain. Goals such as a specific percentage of teacher talk time when using the Taba Strategy is an example of a goal already defined. By diagnosing the students, the quality of the instruction for teacher training can then be geared to the level of development that the student teacher possesses. For an example, in this study student teachers at pre-tape time performed closer to the 50-50 percent level of talk time that the First Strategy of the

Taba Model recommends. Thus, emphasis of instruction may be for keeping student teachers at that level rather than changing it.

As mentioned earlier the performance criteria of the First Strategy of the Taba Model was for the teacher to talk fifty percent of the discussion time. Since the research data in this study showed that there were not significant changes in the three groups in percentage of teacher-pupil talk time from pre to post, the researcher became interested in the quality of the interaction as well as the quantity. At both pre and post times all three groups continually had a higher ratio of indirect as compared to direct teacher talk. The researcher then looked at indirect behavior and found that at pre-tape time an average of nineteen percent of the total talking time for student teachers was of accepting verbal behavior. As a result of the instruction there were significant changes increasing the amount of accepting responses for the Explaining and Peer Teaching group. At post-tape time the Explaining and Peer Teaching group was significantly more accepting than the Explaining and Control groups. The Explaining and Peer Teaching group also improved significantly from pre to post. Explaining and Peer Teaching approached the significant level at post-tape time in being more accepting than the Explaining group. It would appear then that the Explaining and Peer Teaching group gave more accepting responses in the area of verbal behavior due to the element of practice.

These results are important for teacher education for two reasons. First, this study shows that the student teachers' percent of talk time approximates the performance criteria of the First Strategy of the Taba Model actually before instruction occurred. Second, interpreting from

Bondi's reference earlier, classroom teachers talked twenty percent more than the Taba Strategy recommends for a good group discussion. Based on these two facts two questions arose. Will the student teachers' teaching style change markedly when he/she is employed in the role of teacher? If so, can anything be done in the college program to prevent this?

Second, the element of peer teaching seemed to have a significant effect in changing the student teachers' accepting verbal behavior. The interaction with one's own peers and practicing accepting responses seems to be of value.

Quantity and Type of Questions Asked by Teachers

One of the main instructional goals of Concept Development in the Taba Model was to teach the student teacher how to ask a factual question. "What did you hear, see, note? What belongs together?" In the process of developing a concept the student teacher must get the class to list and enumerate all the information the pupils know. This was step one. Step two was getting the pupils to put the facts into groups and labeling. Asking the right kind of factual questions can accomplish this task. To reach steps four and five (subsuming and new groups and labels), broader types of questions are needed as "How would you group these; can you think of any new groups?" If the student teacher was attempting to use the First Strategy he/she would use more factual than broad and open questions. If the appropriate questions were asked, a large number of questions would not be necessary.

Analysis of quantity of questions asked showed that the student teachers in groups EE and C did not ask significantly more or less questions at post-tape time than at pre-tape. No group asked significantly more questions than another at both pre- and post-tape times. But EEPT did ask significantly less questions as compared to the amount at pre-tape time.

The researcher became interested in analyzing the type of questions the three groups asked keeping in mind that the EEPT asked less in quantity at post-tape time.

The results were as follows:

First, even though EEPT asked less questions in quantity, the type of questions changed. The EEPT asked significantly more factual questions at post than at pre-tape time. They also asked significantly more factual questions at post-time than C.

Second, even though the EE group did not change the quantity of questions they asked from pre- to post-time, they did change the type of questions. At post-tape time they asked significantly more factual questions than at pre-tape time. They also asked significantly more factual questions at post-tape time than the control group.

These results are very important in attempting to determine if the student teachers learned the skills of the First Strategy of the Taba Model (concept development). As mentioned earlier, asking factual questions is an important skill in concept development of the Taba Model. It would appear that the group that received the peer teaching performed better because they asked a fewer number of questions but of the questions asked there were more factual than open and broad. This would be consistent with the concept development stage of the First Strategy of the Taba Model. Also, the Explaining group did have a change in the type of their questions and they, too, asked more factual type than broad or open at post-tape time. Thus, the element of instruction affected the Explaining group in a positive fashion as well.

Generalization-Specification Scale

It was one of the researcher's goals in this study to try out the Generalization-Specification Scale, as it was hoped that it might be a useful tool to measure performance criteria for the First Strategy of the Taba Model. The purpose of the instrument was to measure the degree of generalization-specification that the student teacher reached with pupils while developing the concept and leading a group discussion. The tool was used on both the treatment groups but could not be used on the Control because of the nature of the data collection. Both treatment groups, Explaining and Explaining and Peer Teaching obtained similar scores and there were no significant differences between them. In a more extensive analysis of the scores it was found that each group had a large range for performance. The mean scores were EE = 11 and EEPT = 12 but the range was from 4 - 24 for EE and 4 - 21 for EEPT. The standard deviations were high with EE = 5.40 and EEPT = 3.75.

This first attempt at analyzing data collected on the cognitive maps is really the first step for much more extensive research. The fact that there was such a range in scores brings many unanswered questions. This research study shows that the Explaining and Peer

Teaching group could perform according to the performance objectives as shown by accepting behavior and percentage of talk time on the FIAS-22. The question is, however, could they in fact make a difference with pupils they taught in getting them to respond to the type of questioning the student teacher asked? If one considers this question and analyzes the results of the Generalization-Specification Scale for Explaining and Explaining and Peer Teaching, it can be seen that there is a tremendous difference in student teachers' performance within each group.

This tool may have value because it was able to point out the range of scores and go a step further than the FIAS-22 by analyzing what information was generated with pupils.

Perceptions of the Instruction

It was important for the researcher when instructing the two treatment groups to treat them similarly except for the aspect of giving the EEPT practice. The instructional rating survey was administered for the purpose of comparing the two treatment groups' perceptions of the instructor. The results of the comparisons showed that the two groups perceived the instructor similarly on all items except item 19, class discussion. On that item, the EEPT gave the instructor a significantly higher rating. This was as expected because EEPT received the Peer Teaching session and, therefore, it was felt they would rate the instructor higher. The Instructional Rating Survey instrument was a useful tool in fulfilling the purpose for which it was intended.

The information collected on the three groups at post-tape times from the Instructional Rating Survey gave some interesting results. The student teachers in all three groups perceived that they had a total of sixty-three discipline problems during the pre- and post-taping. However, when analyzing the information that the trained rater collected regarding control problems of the student teachers at pre- and post-taping, the rater observed a total of twenty-one for all three groups. The trained rater also noted seven problems the student teachers had in "lack of teacher direction." Thus, the trained rater observed a total of twenty-eight control problems compared to sixty-three that student teachers reported at pre- and post-tape times. The student teacher perceived over twice as many discipline and control problems than the trained rater. This inconsistency could have been due to the student teachers' anxiety about teaching for the first time. The student teacher could have perceived that the problems were greater than they were, or focused on the pupils' behavior before instruction. The researcher did note that some of the pupils coming to and from the taping sessions were inclined to misbehave.

After the mini course instruction all three groups reported a reduction in problems with the concept. Eight reported trouble at pre-tape time and two reported trouble at post-time. The instruction appeared to help the students in learning how to develop a concept as the number of problems reduced at post-tape time. It is also interesting that only eight out of sixty-six students reported that the concept gave them trouble at pre-tape time, while twenty-one reported trouble with discipline.

It may be worthwhile considering a mini course in classroom management and control techniques before any other type of instruction is given, as this may relieve the students' anxiety level.

The researcher was interested in the students' perceptions as to how they learned to lead a group discussion and develop a concept. On the Instructional Rating Survey they were asked to identify from some choices where they felt they learned the skills. It should be remembered that only half of the Control group responded and some chose more than one answer, the results are as follows: thirty-five felt it was taught to them in the project, twelve felt it was from their experience in the campus school and five from a professor other than in the study, ten felt they knew how to do it naturally.

In interpreting the students' own perceptions the researcher found that over half the students thought they learned the skills from the project. But to the researcher's surprise there were those who indeed felt it was a natural ability. Also, some perceived that they learned the skills from the campus school experience. (Remember, the student teachers had a twenty to forty hour observations experience the semester before the research study in the campus school.) Perhaps the teachers in the campus school are more inclined to use group discussion and concept development techniques. The researcher consulted the campus school principal as to this possibility and he seemed to think so.

Use of an Observation Instrument for Student Teachers

The researcher taught all groups the use of an observation instrument. The purpose of this instrument was for the students to learn to analyze their own teaching behavior. (See Appendix H)

The students were required to use the instrument and score their pre-tape along with three or four of their peers. While listening to the tape, the students were to write down the appropriate code for the response they heard. This was to happen every three seconds. This code was called a tally. Then the students were to compare their total number of tallies to their peers. Comparison showed that two-thirds of all the students in the study rated slower than their peers when rating themselves. The researcher did not document this data at the time she taught the groups because she did not realize there was a pattern. However, it is reported here because it could be of value, especially when training students in self-evaluation. There are a number of possible reasons for the slower scoring. It could be due to hearing one's ownself as a teacher for the first time. It could be due to the emotionality of identifying with one's self, or it could be due to the anxiety of hearing one's own tape in front of his/her peers.

Further Recommendations

The researcher feels strongly that the nature of this research should continue. More diagnostic information should be collected on student teachers before they first receive instruction.

The Explaining and Peer Teaching is an effective method, more so than the Explaining and should be used when teaching the First Strategy of the Taba Model.

Much more collecting of data on cognitive maps is needed to research the Generalization-Specification Scale. A technique should be devised for comparing the treatment groups with the control in order to validate the instrument.

A course in classroom management and control techniques would be useful before any other skill instruction for new students.

A longitudinal study should occur following this research. Data should again be collected using the same post-tape assignment at time of exit from the Teacher Education Program for this same student teacher population. This new set of data would be compared to the results of this study. These results would identify whether or not the skills were retained.

A followup study should continue after two years of teaching experience using the same assignment. It would be interesting to look at the "role effect" once the student teacher was employed.

Since some of the student teachers indicated that they have a natural teaching ability, research should be done to identify what skills they possess before instruction.

APPENDIX A

First Strategy of the Taba Model

Concept Formation

Overt Activity	Covert Mental Operations	Eliciting Questions
1. Enumeration and listing	Differentiation	What did you see? hear? note?
2. Grouping	Identifying common properties, abstracting	What belongs together? On what criterion?
3. Labeling, categorizing	Determining the hierarchical order of items. Super- and sub-ordination	How would you call these groups? What belongs to what?

(Taba, 1967, p. 92)

APPENDIX B

COGNITIVE MAP

Name______________________________
Number____________________________
No. of Pupils______________________

Topic___________________________________
Level___________________________________
Length of Time__________________________

<table>
<tr><th>Possible List (Step One)</th><th>Possible Groups and Labels (Steps Two and Three)</th><th>Possible Subsuming (Step Four)</th></tr>
<tr><td rowspan="3"></td><td></td><td rowspan="3">Items Under Labels
Labels Under Labels</td></tr>
<tr><td>Possible New Groups and Labels (Step Five)</td></tr>
<tr><td></td></tr>
</table>

*Revised from Institute for Staff Development 1971

APPENDIX C

SUB-CATEGORIES FOR FLANDERS' EXPANDED CATEGORY SYSTEM

Ned A. Flanders

Level Category	1	2	3	4
1	No subscripts for category 1. Accepts students' feelings			
2	Superficial encouragement like "um hm" and expressions like "right," "good," etc.	Longer praise statements, often explaining praise. Most genuine. Kid really hears it.		
3	Merely repetition superficial recognition of students' idea.	Student's idea is developed (or used) by teacher as seen by teacher.	Student's idea is developed by teacher in terms of other ideas or compares to other pupil ideas.	Asks questions in levels 2 or 3.
4	Narrow factual questions, e.g., What? Where? When? and other questions emphasizing recall.	Broad, general, open questions which clearly permit a choice of response. Asks opinion.		
5	Narrow, factual focus. Restricted concepts & purpose. Low level in terms of reasoning.	Not level (1) and not level (3).	Negative and critical, but not "7". Disagrees without comment or explanation.	
6	Narrow commands to which compliance is expected and can be easily judged.	Explains his directions and how something is to be done.	Provides alternatives, reasons, invites students to help decide what must be done next.	
7	No subscripts for category 7. Criticism			
8	Student responds by making a statement.	Student asks questions in "tight" format along teacher's lines of thought.		
9	Student responses showing freedom of own ideas or simply taking the initiative in terms of talking.	Student asks questions showing freedom of student thought or initiative.		
10	Non-constructive use of time.	Constructive use of time.		

APPENDIX D

Information Form for Student Teachers

Please fill out the following form.

Name:

Age:

Sex: Male_____ Female_____

Approx. No. of hours taken up to this semester ________.

Have you ever taught in a classroom before?________

Grade level of students you would like to teach when you finish college

__________.

Write down your morning schedule.

Monday	Tuesday	Wednesday	Thursday	Friday

APPENDIX E

Policy Statement

This statement was given to all the student teachers during the first general meeting of their methods course, January 14, 1975. The chairman of the Elementary Education Department, Dr. Clarence Trexler, gave the statement and then introduced the researcher.

The policy statement was audio taped and this is the transcript from that tape. Dr. Trexler speaking -

> "Basically what it is going to mean for you people is that this is going to be one of transitional transactions from the old program. In the process of going through this competency-based instruction, we have to develop learning modules so we are going to be spending a good portion of our time developing some learning modules with you. And Miss Anne Stewart is here and she is going to be working on that phase, so this will be a required part of the course. I think it will be a part you will enjoy as much as anything and I'm just explaining to you that it's also somewhat of an experiment, yet it is a major part of the course. As I say Miss Stewart will be working on that. Basically, that's all I have to say and we'll talk more about it as we go along."

APPENDIX F

ASSIGNMENT FOR PRE-TAPING

Please read these directions carefully.

You will be required to lead a group discussion and develop a concept of your own choice with an assigned group of 5 or 6 elementary pupils from the campus school for a period of 15 minutes. An audio-tape of your session will be collected. An outline must be handed in at that time which states the concept and procedure for carrying it out. The concept can be from any area.

ASSIGNMENT FOR POST-TAPING

Please read these directions carefully.

You will be required to lead a group discussion and develop a concept of your own choice with an assigned group of 5 or 6 elementary pupils from the campus school for a period of 15 minutes. An audio-tape of your session will be collected. An outline must be handed in at that time which states the concept and procedure for carrying it out. The concept can be from any area.

APPENDIX G

CODING SYSTEM devised by Crayton Buck
Group, Names and Ages of Pupils in Campus School,
State University of New York, Oswego, N.Y.

Code: P = 7 yr. olds
CO = 8 yr. olds
B = 9 yr. olds
S = 10 yr. olds
M = 11 yr. olds

I - X = the groups

Example: PIII = group 3 of 7 yr. olds

---

7 & 8 yr. olds

PI
Ambrosetti, Joe
Button, Karin
Lester, Sara
Lipsig, Charles
Rose, Brenda
Susino, Tony

PII
Cutler, Eric
Davis, Penny
Linn, Susan
Mustico, Tom
Scullin, Sheilagh

PIII
D'Innocenzo, Pam
Everts, Tim
Luongo, Suzanne
Peterson, Jim
Weber, Connie

PIV
Forrester, Bonnie
Francisco, David
O'Donnell, Maureen
Schaffer, Michael
West, Jeffrey

PV
Gunther, Chris
Lindengerg, John
Rabozzi, Gina
Sivers, T.C.
Van Geet, Paul

COI
Bruce, David
Reardon, Mary
Lloyd, James
Soter, Bruce
Kimoges, Marie

COII
Butler, Michael
Thomas, Kevin
Galvin, Brigid
Root, Jeff
Weber, Judelle

COIII
Davis, Steve
West, Paul
Gittlen, Michele
Germain, Suzy
Riley, Leanne

COIV
Kaumeheiwa, Keala
Huang, Helena
Burritt, James
Sculley, Brian
Greene, Kathy
Mark, Kevin

COV
Rath, Tom
Liu, Cynthia
Gunther, Mike
Simpson, Andy
Jochen, Nancy

COVI
Regan, Jeff
Aldrich, Joann
Winslow, Erika
Rosenberry, Rick
Harrington, Kelly

9 year olds

BI
Bowman, David
Richmond, Tony
Black, Iain
Barach, Ann
Wasenaar, Wendy

BII
Bruce, James
Banta, Pat
Corradino, Bill
Beckmeier, Michelle
West, Denise

BIII
Cali, Mike
Bridgers, Lori
Everts, Scott
Bruce, Kevin
VanGeet, Corrina

BIV
Chermack, Steve
Davies, Sara
Halstead, Tim
Case, Sharon
Silveira, Karen

BV
Endres, Paul
Hurlbutt, Beth
Homik, Tim
D'Ambrosio, Pat
Reed, Joe
Baughman, Warren

BVI
Kessler, Andy
Hutko, Karen
Loe, Tait
Merrill, Robin
Smith, Todd

BVII
Mahajan, Raj
McLaughlin, Tim
Mayer, John
Odin, Michelle
Olyarchuk, John

BVIII
Maxon, Bob
Rhinehart, Tanya
Olin, Kevin
Sherman, Doreen
Purtell, Mark

10 year olds

SI
Altimonte, James
Henry, Scott
Sherman, Daryl
Cox, Lisa
Krupa, Karen

SII
Barbarino, Ross
Hurlbutt, Paul
Stepien, Richard
Crego, Nadeen
Lester, Donna

SIII
Burkhardt, Walter
McKean, J.D.
Stuart, Scott
DeForest, Cindy
Mustico, Laura

SIV
Davis, Matthew
McLaughlin, James
Thompson, John
Doyle, Kelly
Odin, Gemma

SV
Dowd, John
Morrison, David
Tryon, Steve
Doyle, Shelly
Safferman, Jenny

SVI
Dupuis, Fred
Reardon, Arthur
Wagner, Scott
Glerum, Sandy
Spicer, Terry
Farag, Shereen

SVII
Galvin, James
Rock, John
Cassens, Mary
Hinman, Darlene
Walters, Julie

SVIII
Gooding, Mark
Schum, Mike
Carradino, Carlotta
Kessler, Barbara
Wernick, Debbie

SIX
Gunther, Jeff
Sculley, Mike
Cox, Cindy
King, Chris
Workmaster, Beth

11 year olds

MI
Burling, Temple
Shurr, Mike
Rath, Lisle
Murray, Donna
Carnes, Cindy

MII
Cassens, Ed
Thomas, Steve
Root, Jim
Nesbitt, Betsy
Colloca, Patty

MIII
Collins, Tom
Wasenaar, Jim
Smith, Scott
Powell, Jean
D'Amico, Stephanie

MIV
Cutler, Chris
Brown, Dan
VanSchaack, Tom
Rabozzi, Annette
Butko, Kathy

MV
Gunther, Bill
Burritt, Scott
Wells, Jeff
Rhinehart, Ana
Mayer, Joann

MVI
Hawkins, Hal
Button, Eric
Bivens, Tammy
Syrell, Lisa
Merrill, Shelley

MVII
Pratt, Rick
Cali, Shawn
Caroccio, MaryAnn
Aldrich, Nan
Nellis, Sue

MVIII
Purtell, Mike
Clark, Tim
Gianetto, Marion
Borrow, Stephanie
Peterson, Jane

11 year olds cont'd

MIX	MX
Roney, Mark	Shoemaker, Kyle
Ferraro, Bill	Proud, Mike
Lanphear, Annette	Lisk, Maxine
Burling, Koren	Butler, Ellen
Sherman, Denise	Dickson, Kathleen

APPENDIX H

Logs for Mini Course for
Explaining and Explaining and Peer Teaching Groups

Information and Directions Given to All Student Teachers in the Study

1/14/75 1/2 hr. instruction time	General session with all students involved in the research. Researcher was introduced to the students. A policy statement was given by Clarence Trexler. Researcher issued group assignments.
1/17/75 1 hr. instruction time	General session with all students. Researcher had students fill out information form. She went over the pre-tape assignment, gave tips on dealing with the pupils, discussed the recording techniques and use of the cassette, reviewed schedule for taping and class instruction.

Mini Course for Explaining Group

1st Session - 3 hrs. - 12:30-3:30

The researcher covered the following:

A. The researcher explained that her purpose with the students was to help them learn some new teaching skills which research found could improve pupils' levels of thinking.

B. The researcher also explained the purpose of the pre-tape to the students. The purpose of the pre-tape assignment was to determine how the student teachers thought they should lead a group discussion and develop a concept.

Theory and Content

Discussed The researcher talked about the following: thinking skills in children, the history of Hilda Taba, about people who influenced her (Piaget and Dewey), discussed her research, what Joyce said about her model, presented the model with emphasis on the First Strategy. Gave students a hand-out of the model (See Appendix A)

A definition for concept, strategy and group discussion was formulated using students' information.

Break

Tape

Taught students an observation instrument to analyze verbal interaction between teacher and pupil. Then class practiced using the instrument on two audio tapes. The researcher played the tapes to the class and the students scored them. The first tape had a student teacher who was supposed to be developing a concept and leading a group discussion with children. The student teacher in this tape pictured himself as an information giver and talked most of the time.

The second tape was of another student who was also attempting to carry out the assignment. He had the class read from their books aloud for the entire taping time.

The purpose for playing the two tapes was to have the students make some judgments about the quality of teaching they were listening to.

The student teacher used the observation instrument taught to collect objective data. Based on this information and their own opinions, they discussed the verbal behavior from the tapes with the researcher.

Assignment given: Memorize the First Strategy of the Taba Model
Students were told they would score their own tape the next class session.

2nd Session - 3 hrs. - 12:30-3:30

Tape Analysis

The researcher divided class up into groups of 3 or 4 student teachers and handed back each student's pre-tape. Each group scored as a whole each person in that group's tape.

The researcher met with the class as a whole and analyzed the patterns that the students recorded.

Break

First Strategy of the Taba Model

Researcher demonstrated the model using the concept of "Bees."

Assignment: Post-tape assignment was given and discussed.

OBSERVATION INSTRUMENT
FOR
CLASSROOM
CONCEPT DEVELOPMENT DISCUSSIONS

Adapted from Institute for Staff Development

INTERACTION

Rules for scoring: Record every three seconds the response for whoever is talking. As the discussion proceeds, mark in the following squares each time the teacher asks (A) or tells (t) and each time the students ask (a) or tell (t). Record in the order that each occurs. Count tallies at the end for ratios and totals.

Teacher														
Student														

Teacher														
Student														

Teacher														
Student														

Teacher														
Student														

Teacher														
Student														

Teacher														
Student														

Totals:
TT_____
TA_____
ST_____
SA_____

Ratios:
TA_____ SA_____
T Talk_____ S Talk_____

3rd Session - 12:30-3:30

The researcher discussed the induction method of teaching First Taba Strategy.

Discussed use of cognitive map and demonstrated how to fill in a cognitive map. Explained how to use it with elementary pupils, how to teach it to them as well. Gave instructions for post-tape again and assigned time.

---

1 hr. Students fulfilled requirement of post-tape.

Mini Course for Explaining and Peer Teaching

1st Session - 3 hrs. - 12:30-3:30

The researcher presented the same information during the first session as she did in the Mini course for the Explaining group. (See previous section.)

2nd Session - 3 hrs. - 12:30-3:30

Tape Analysis Same as in Mini course for Explaining

Break

Demonstrated First Strategy of the Taba Model on the concept "Bees."

Taught how to use cognitive map

Gave post-tape assignment, and told students during the next class session they would have to teach two concepts using the Taba Strategy and cognitive map.

3rd Session - 12:30-3:30

Reviewed First Strategy of the Taba Model

Practice The researcher broke the class down into small groups of four or five students. Each person had to teach his group two times during the afternoon developing a concept and leading a group discussion. The peers acted as the pupils. At the end of the teaching (Approx. 15 min.) the peers filled in a cognitive map and gave the student teacher feedback as to his/her success in using the skills of the First Strategy of the Taba Model.

The researcher sat in on the sessions for a few minutes giving some feedback.

Assignment: Post-tape assignment was given.

---

1 hr. Students fulfilled post-tape assignment.

APPENDIX I

Length of Time Between Pre- and Post-Taping for the Three Groups: Explaining EE, Explaining and Peer Teaching EEPT, and Control C

Date	Group	No. People in Group	Date	Group	No. People in Group	Total of Days Between Pre- and Post-Taping
Jan. 20	C_1	13	Feb. 3	C_1	13	14
21	EE_1	11	4	EE_1	11	13
22	$EEPT_1$	12	5	$EEPT_1$	12	13
23	EE_2	10	6	EE_2	10	13
27	$EEPT_2$	12	7	$EEPT_2$	12	11
28	C_2	8	12	C_2	8	15

Average days between Pre- and Post for EE, EEPT and C

EE - 13
EEPT - 12
C - 14.5

APPENDIX J

COGNITIVE MAP

Name________________________

Number________________________

No. of Pupils__________________

Topic Places to Visit

Level 9 yr. olds

Length of Time 15 min.

<table>
<tr><th>Possible List (Step One)</th><th>Possible Groups and Labels (Steps Two and Three)</th><th>Possible Subsuming (Step Four)</th></tr>
<tr><td rowspan="3">Connecticut
Yellowstone Park
Cooperstown
Florida
Boating
Cape Cod
Swimming
Camp
Baseball
Georgia
Heart Lake
White House
Lincoln Memorial
Monuments
Japan
$N_e = 15$</td><td>Places they have visited
Georgia
Washington
Florida
Activities-things to do
swim
boating
baseball
Lincoln Memorial
camp
$N_g = 8$
$N_1 = 8$</td><td rowspan="3">Items Under Labels
Bald Mountain
Catskill game farm
Labels Under Labels
Sports
hiking swimming camping
baseball boating
Sightseeing
Lincoln Memorial
Disneyland
$N_a = 9$</td></tr>
<tr><td>Possible New Groups and Labels (Step Five)</td></tr>
<tr><td>Places that are warm
Florida
Mexico
$N_r = 2$</td></tr>
</table>

*Revised from Institute for Staff Development 1971

SCORING FOR COGNITIVE MAP

GENERALIZATION-SPECIFICATION SCALE

N_e = 15

N_g = 8

N_l = 8

N_a = 9

N_r = 2

T = 15 min.

$$\frac{N_e + 2N_g + 3(N_l + N_a) + 4N_r)}{T}$$

$$\frac{15 + 2(8) + 3(8+9) + 4(2)}{15}$$

$$\frac{90}{15} = 6$$

(Scoring procedure is shown in Chapter III.)

APPENDIX K

TABLE 2–1
Flanders' Interaction Analysis Categories* (FIAC)

Teacher Talk	Response	1. *Accepts feeling.* Accepts and clarifies an attitude or the feeling tone of a pupil in a nonthreatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included.
		2. *Praises or encourages.* Praises or encourages pupil action or behavior. Jokes that release tension, but not at the expense of another individual; nodding head, or saying "Um hm?" or "go on" are included.
		3. *Accepts or uses ideas of pupils.* Clarifying, building, or developing ideas suggested by a pupil. Teacher extensions of pupil ideas are included but as the teacher brings more of his own ideas into play, shift to category five.
		4. *Asks questions.* Asking a question about content or procedure, based on teacher ideas, with the intent that a pupil will answer.
	Initiation	5. *Lecturing.* Giving facts or opinions about content or procedures; expressing *his own* ideas, giving *his own* explanation, or citing an authority other than a pupil.
		6. *Giving directions.* Directions, commands, or orders to which a pupil is expected to comply.
		7. *Criticizing or justifying authority.* Statements intended to change pupil behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing: extreme self-reference.
Pupil Talk	Response	8. *Pupil-talk—response.* Talk by pupils in response to teacher. Teacher initiates the contact or solicits pupil statement or structures the situation. Freedom to express own ideas is limited.
	Initiation	9. *Pupil-talk—initiation.* Talk by pupils which they initiate. Expressing own ideas; initiating a new topic; freedom to develop opinions and a line of thought, like asking thoughtful questions; going beyond the existing structure.
Silence		10. *Silence or confusion.* Pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

*There is *no* scale implied by these numbers. Each number is classificatory; it designates a particular kind of communication event. To write these numbers down during observation is to enumerate, not to judge a position on a scale.

(Flanders, 1970)

APPENDIX L

Flanders Interaction Analysis System-22
Matrix

Category	10	21	22	31	32	33	34	41	42	51	52	53	61	62	63	70	81	82	91	92	01	02	Total
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
21	0	0	0	1	0	1	0	2	0	2	0	0	1	0	0	0	1	0	1	0	0	2	11
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
31	0	1	0	1	1	0	1	9	1	9	0	0	1	0	0	0	2	0	2	0	0	1	30
32	0	0	0	0	4	0	0	1	0	2	0	0	1	0	0	0	0	0	1	0	0	2	13
33	0	0	0	0	0	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	7
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	3	0	0	0	8
41	0	0	0	0	0	0	0	19	1	4	0	0	3	0	0	2	63	0	3	0	0	7	103
42	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	4	0	3	0	0	1	13
51	0	0	0	0	0	0	0	26	2	141	4	0	8	1	0	4	6	1	6	1	0	10	211
52	0	0	0	0	0	0	0	2	1	3	14	0	1	0	0	0	0	0	1	0	0	1	22
53	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	2	0	0	0	0	0	6
61	0	0	0	0	0	0	0	4	0	5	0	0	30	3	1	3	9	1	3	1	0	16	76
62	0	0	0	0	0	0	0	0	0	1	0	0	1	6	0	0	0	0	0	0	0	2	12
63	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3
70	0	0	0	0	0	0	0	3	0	3	0	0	3	0	0	22	2	0	2	0	0	10	45
81	0	4	0	22	1	0	1	20	2	18	1	5	9	0	0	4	68	0	7	0	0	6	169
82	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	1	0	0	0	0	5
91	0	4	0	6	3	3	2	5	1	4	0	1	2	0	0	2	2	0	52	1	0	2	90
92	0	0	0	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	9
01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
02	0	0	0	0	0	0	0	9	1	13	1	0	11	1	0	6	6	2	5	2	0	105	164
Total	1	11	1	30	13	7	8	103	13	211	22	6	76	12	3	46	169	5	90	9	2	164	1,000

Total tallies = 12, 386

Fig. 5–5. Twenty-Two-Category Matrix: Fourth Grade Social Studies; Teacher K.

Flanders (1970) pp. 142-43

APPENDIX M

INSTRUCTIONAL RATING SURVEY

Adapted from George G. Stern and Joel Richman

For each of the questions below that applies to this course, choose an alternative from the following list that best describes it in relation to all other courses you've taken at Oswego.

1. exceptional/outstanding
2. above average
3. average
4. below average/just adequate
5. unsatisfactory

1. Instructor's willingness to hear ideas from students
2. Instructor's patience
3. Instructor's warmth
4. Instructor's availability to meet with students
5. Instructor's personal interest in the class
6. Instructor's enjoyment of teaching
7. Instructor's ability to involve students in the course material
8. Instructor's willingness to help students who are having difficulty
9. Instructor's ability to help students learn the material
10. Instructor's concern for student progress
11. Instructor's knowledge of the course material
12. Quality of the instructor's preparation for class periods
13. Instructor's ability to provoke thought and stimulate critical thinking
14. Instructor's coverage of overall course content
15. Intellectual challenge provided by the course
16. Effectiveness of the course in providing new viewpoints
17. Increase in understanding of the subject matter due to the course
18. Rating of overall method
19. Rating of class discussions
20. Rating of paper and/or outside work as learning experiences
21. In my pretaping I had the most trouble with:
    1. Discipline
    2. The concept
    3. Both
    4. Neither
22. I learned how to lead a group discussion from:
    1. Previous experience in the campus school
    2. My professors other than in the project
    3. I do it naturally
    4. From the project
    5. Other (Please explain)
23. In the post taping I had the most trouble with:
    1. Discipline
    2. The concept
    3. Both
    4. Neither

APPENDIX N

INSTRUCTIONAL RATING SURVEY
Form 1173

George G. Stern and Joel Richman

Psychological Research Center
250 Machinery Hall
Syracuse University

For each of the questions below that applies to this course, choose an alternative from the following list that best describes it in relation to all other courses you've taken at Syracuse University:

1. exceptional/outstanding
2. above average
3. average
4. below average/just adequate
5. unsatisfactory

1. instructor's willingness to hear ideas from students
2. instructor's patience
3. instructor's warmth
4. instructor's availability to meet with students
5. instructor's personal interest in the class
6. instructor's enjoyment of teaching
7. instructor's ability to involve students in the course material
8. instructor's willingness to help students who are having difficulty
9. instructor's ability to help students learn the material
10. instructor's concern for student progress
11. instructor's knowledge of the course material
12. quality of the instructor's preparation for class periods
13. instructor's contribution above and beyond readings
14. instructor's ability to provoke thought and stimulate critical thinking
15. instructor's coverage of overall course content
16. intellectual challenge provided by the course
17. effectiveness of the course in providing new viewpoints
18. increase in understanding of the subject matter due to the course
19. rating of lectures
20. rating of class discussions
21. rating of paper and/or outside work as learning experiences
22. exams as indicators of knowledge gained in the course
23. exams as indicators of personal growth due to the course
24. relevance of exams to material covered in the course
25. increase in understanding of subject matter due to the readings
26. rating of the text
27. rating of readings other than the text
28. fairness of the grading procedures
29. method of assigning grades
30. equity of work load for credit received
31.
32. For Optional
33. use by the
34. instructor
35.

TURN PAGE OVER

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STUDENT CHARACTERISTICS

36. Sex:
    (1) male (2) female

37. Class status:
    (1) freshman (2) sophomore (3) junior (4) senior (5) graduate

38. Term:
    (1) fall (2) spring (3) summer (4) other

39. Estimate of your grade in this course:
    (1) A (2) B (3) C (4) D (5) F

40. Estimate of your grade if course is pass/fail:
    (1) pass (2) fail

41. Your grade point average (GPA) is closest to:
    (1) 4.0 (A) (2) 3.0 (B) (3) 2.0 (C) (4) 1.0 (D)

42. Is the course in your intended or actual major?
    (1) yes (2) no

43. Is this course required for your degree program?
    (1) yes (2) no

44. How many other courses in addition to this one have you taken in this same department?
    (1) 0 (2) 1-2 (3) 3-4 (4) 5-6 (5) 7 or more

APPENDIX O

Summary Results of Comparisons Between Groups EE and EEPT on Their Ratings of the Instructor on Each Item of the Adapted Instructor's Rating Survey. (George C. Stern and Joel Richman)

Table 1 - Instructor's willingness to hear ideas from students

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent
1. exceptional/outstanding	7	36.8	11	45.8
2. above average	8	42.1	10	41.7
3. average	4	21.0	3	12.5
4. below average/just adequate	0	0	0	0
5. unsatisfactory	0	0	0	0

Mean = 1.8421 Mean = 1.6667
N = 19 N = 24
T = .78
S16 = .438

Table 2 - Instructor's Patience

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	9	47.4	9	37.5
2. above average	8	42.1	12	50.0
3. average	2	10.5	3	12.5
4. below average/just adequate	0	0	0	0
5. unsatisfactory	0	0	0	0

Mean = 1.6316 Mean = 1.7500
N = 19 N = 24
T = -0.57
S16 = .573

Table 3 - Instructor's warmth

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent
1. exceptional/outstanding	4	21.1	4	16.7
2. above average	12	63.2	14	58.3
3. average	3	15.8	6	25.0
4. below average/just adequate	0	0	0	0
5. unsatisfactory	0	0	0	0

Mean = 1.9474
N = 19

Mean = 2.0833
N = 24

T = -0.69
S16 = 0.493

Table 4 - Instructor's availability to meet with students

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent
1. exceptional/outstanding	10	52.6	8	33.3
2. above average	5	26.3	9	37.5
3. average	4	21.1	7	29.2
4. below average/just adequate	0	0	0	0
5. unsatisfactory	0	0	0	0

Mean = 1.6842
N = 19

Mean = 1.9583
N = 24

T = -1.10
S16 = 0.278

Table 5 - Instructor's personal interest in the class

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	9	47.4	9	37.5
2. above average	7	36.8	11	45.8
3. average	3	15.8	4	16.7
4. below average/just adequate	0	0	0	0
5. unsatisfactory	0	0	0	0

Mean = 1.6842
N = 19

Mean = 1.7917
N = 24

T = -0.48
S16 = 0.636

Table 6 - Instructor's enjoyment of teaching

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	8	42.1	6	25.0
2. above average	8	42.1	12	50.0
3. average	3	15.8	6	25.0
4. below average/just adequate	0	0	0	0
5. unsatisfactory	0	0	0	0

Mean = 1.7368
N = 19

Mean = 2.0000
N = 24

T = -1.18
S16 = 0.245

Table 7 - Instructor's ability to involve students in the course material

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	5	26.3	10	41.7
2. above average	7	36.8	8	33.3
3. average	6	31.6	5	20.8
4. below average/just adequate	1	5.3	1	4.2
5. unsatisfactory	0	0	0	0

Mean = 2.1579
N = 19

Mean = 1.8750
N = 24

T = 1.02
S16 = 0.312

Table 8 - Instructor's willingness to help students who are having difficulty

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent
1. exceptional/outstanding	10	52.6	9	37.5
2. above average	6	31.6	11	45.8
3. average	3	15.8	4	16.7
4. below average/just adequate	0	0	0	0
5. unsatisfactory	0	0	0	0

Mean = 1.6316
N = 19

Mean = 1.7917
N = 24

T = -0.71
S16 = 0.484

Table 9 - Instructor's ability to help students learn the material

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	7	36.8	7	29.2
2. above average	8	42.1	12	50.0
3. average	3	15.8	4	16.7
4. below average/just adequate	1	5.3	1	4.2
5. unsatisfactory	0	0	0	0

Mean = 1.8947
N = 19

Mean = 1.9583
N = 24

T = -0.25
SIG = 0.806

Table 10 - Instructor's concern for student progress

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	9	47.4	8	33.3
2. above average	7	36.8	9	37.5
3. average	3	15.8	7	29.2
4. below average/just adequate	0	0	0	0
5. unsatisfactory	0	0	0	0

Mean = 1.6842
N = 19

Mean = 1.9583
N = 24

T = -1.14
SIG = 0.260

Table 11 - Instructor's knowledge of the course material

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	11	57.9	7	29.2
2. above average	5	26.3	12	50.0
3. average	3	15.8	4	16.7
4. below average/just adequate	0	0	1	4.2
5. unsatisfactory	0	0	0	0

Mean = 1.5789
N = 19

Mean = 1.9583
N = 24

T = -1.56
SIG = 0.126

Table 12 - Quality of the instructor's preparation for class periods

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	8	42.1	5	20.8
2. above average	5	26.3	15	62.5
3. average	5	26.3	3	12.5
4. below average/just adequate	1	5.3	1	4.2
5. unsatisfactory	0	0	0	0

Mean = 1.9474
N = 19

Mean = 2.0000
N = 24

T = -0.20
SIG = 0.839

Table 13 - Instructor's ability to provoke thought and stimulate critical thinking

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent
1. exceptional/outstanding	4	21.1	4	16.7
2. above average	6	31.6	11	45.8
3. average	8	42.1	7	29.2
4. below average/just adequate	1	5.3	2	8.3
5. unsatisfactory	0	0	0	0

Mean = 2.3158
N = 19

Mean = 2.2917
N = 24

T = .09
SIG = .929

Table 14 - Instructor's coverage of overall course content

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1.exceptional/outstanding	4	21.1	2	8.7
2. above average	7	36.8	8	34.8
3. average	6	31.6	13	56.5
4. below average/just adequate	2	10.5	1	0
5. unsatisfactory	0	0	0	0

Mean = 2.3158
N = 19

Mean = 2.4783
N = 23
Missing - 1 observation

T = -0.65
SIG = 0.518

Table 15 - Intellectual challenge provided by the course

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	2	10.5	3	12.5
2. above average	6	31.6	8	33.3
3. average	10	52.6	9	37.5
4. below average/just adequate	1	5.3	3	12.5
5. unsatisfactory	0	0	1	4.2

Mean = 2.5263 Mean = 2.6250
N = 19 N = 24
T = -.35
SIG = .727

Table 16 - Effectiveness of the course in providing new viewpoints

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	4	21.1	6	25.0
2. above average	6	31.6	10	41.7
3. average	7	36.8	5	20.8
4. below average/just adequate	2	10.5	3	12.5
5. unsatisfactory	0	0	0	0

Mean = 2.3684 Mean = 2.2083
N = 19 N = 24
T = .54
SIG = .593

Table 17 - Increase in understanding of the subject matter due to the course

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	3	15.8	6	25.0
2. above average	8	42.1	10	41.7
3. average	6	31.6	7	29.2
4. below average/just adequate	2	10.5	1	4.2
5. unsatisfactory	0	0	0	0

Mean = 2.3684 Mean = 2.1250
N = 19 N = 24
T = .91
SIG = .368

Table 18 - Rating of Overall Method

	EE		EEPT	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. exceptional/outstanding	2	10.5	1	4.2
2. above average	8	42.1	17	70.8
3. average	6	31.6	3	12.5
4. below average/just adequate	3	15.8	2	8.3
5. unsatisfactory	0	0	1	4.2

Mean = 2.5263 Mean = 2.3750
N = 19 N = 24
T = .55
SIG = .582

Table 19 - Rating of class discussions

	EE absolute frequency	EE adjusted frequency (percent)	EEPT absolute frequency	EEPT adjusted frequency (percent)
1. exceptional/outstanding	1	5.3	1	4.2
2. above average	3	15.8	11	45.8
3. average	9	47.4	10	41.7
4. below average/just adequate	5	26.3	2	8.3
5. unsatisfactory	1	5.3	0	0

Mean = 3.1053
N = 19

Mean = 2.5417
N = 24

T = 2.23*
SIG = 0.031

*Significant at .05 level

Table 20 - Rating of paper and/or outside work as learning experiences

	EE absolute frequency	EE adjusted frequency (percent)	EEPT absolute frequency	EEPT adjusted frequency (percent)
1. exceptional/outstanding	3	15.8	5	20.8
2. above average	8	42.1	10	41.7
3. average	8	42.1	8	33.3
4. below average/just adequate	0	0	1	4.2
5. unsatisfactory	0	0	0	0

Mean = 2.2632
N = 19

Mean = 2.2083
N = 24

T = .23
SIG = .823

APPENDIX P

1_a

In the pre-taping I had the most trouble with -

	EE		EEPT		C		Total	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. Discipline	7	38.9	4	16.7	5	41.7	16	29.6
2. Concept	2	11.1	6	25.0	1	8.3	9	14.8
3. Both	1	5.6	3	12.5	6	50.0	10	9.3
4. Neither	8	44.4	11	45.8	0	0	19	46.3
5. No answer	1	0	0	0	0	0	1	0
	Mean = 2.556 N = 18 1 missing observation		Mean = 2.875 N = 24		Mean = 2.66 N = 12		Mean = 2.722 N = 55 1 missing observation	

1_b

In the post-taping I had the most trouble with -

	EE		EEPT		C		Total	
	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)	absolute frequency	adjusted frequency (percent)
1. Discipline	11	61.1	14	58.3	3	25.0	28	51.9
2. Concept	1	5.6	1	4.2	0	0	2	3.7
3. Both	1	5.6	3	12.5	0	0	4	7.4
4. Neither	5	27.8	6	25.0	9	75.0	20	37.0
5. No answer	1	0	0	0	0	0	1	0
	Mean = 2.000 N = 18 1 missing observation		Mean = 2.042 N = 24		Mean = 3.250 N = 12		Mean = 2.296 N = 54 1 missing observation	

Summary 1_c

Variables That Students Reported at Pre and Post Taping Time

Groups	Problems with Discipline			Problems with the Concept			Both			Neither		
	Pre	Post	Total	Pre	Post	Total	Pre	Post	Total	Pre	Post	Total
EE	7	11	18	2	1	3	1	1	2	8	5	13
EEPT	4	14	28	6	1	7	3	3	6	11	6	17
C	5	3	8	0	0	0	1	0	1	6	9	15
Totals	16	28	54	8	2	10	5	4	9	25	20	45

NOTE: Make sure you read summary on page 85 of Chapter V to interpret this table.

TABLE 1_d

The students reported that they learned how to lead a group discussion from the following. (Some chose more than one answer.)

	No. students that answered	Previous experience in Campus School	My Prof. other than in study	Do it natural-ly	From the project	Other
EE	18	3	3	1	13	1
EEPT	24	4	0	4	20	1
C	12	5	2	5	2	1
Total	54	12	5	10	35	3

APPENDIX Q

Variables That Rater Noted at Pre and Post Taping Times

Groups	Control Problems			Lack of Teacher Direction			Poor Tape Quality			Second Taping		
	Pre	Post	Total	Pre	Post	Total	Pre	Post	Total	Pre	Post	Total
EE	3	4	7	2	0	2	8	1	9	0	0	0
EEPT	4	3	7	3	0	3	2	2	4	0	0	0
C	4	3	7	0	2	2	3	0	3	3	0	3
Totals	11	10	21	5	2	7	13	3	16	3	0	3

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